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The Foundry Industry in 1953

As was expected, the statistics of production for 1953 of the foundry industry showed declines ranging from the negligible to the serious. Into the latter category entered those for the brass-and-bronze division, where there was a decline from 66,303 tons in 1952 to 50,093 tons last year. An interesting feature about these figures is that the higher production was registered during a time of acute shortage of some of the raw materials. Not so badly hit, but still quite seriously affected, was the light-alloy division of the industry, where the decrease was of the order of 12,000 tons. The production was 65,556 tons last year and 77,348 in 1952. The figures include both sand-cast and die-cast material. The production of magnesium castings last year was 4,088 tons. The production of steel castings last year, at 306,800 tons, was only slightly less (about 1.0 per cent.) than the 1952 record production of 310,000 tons. Included in the 1953 figures were some exceedingly heavy castings, but they occupy floor space for a prolonged period and may not influence the overall production from the shops.

Of the iron-castings production for 1953, grey and high-duty iron accounted for 3,504,000 and malleable 134,000 tons (total 3,638,000 tons), a figure some 3.2 per cent. lower than last year's record (3,830,737 tons). However, it should be noted that the 1953 total was also lower than in 1951 (3,752,527 tons). This section of the industry is currently employing 141,220 process workers, whereas in 1950 there were 140,440 with a production of 3,486,892 tons—giving an increase in productivity approaching 4 per cent. Decreases were registered in the production of automobile, engineering, jobbing and railway-equipment casting groups, whilst increases were shown in the output of builders' castings, pipes and malleable tube-fittings, and ingot moulds. The increase of builders' castings—an all-time record total—could reasonably have been expected, owing to the expansion in housing construction, yet during the year there were more reports of slackness in this section than in engineering and jobbing, which showed the heaviest decline.

The foundry industry is never uniformly depressed or booming, as the various sections respond to conditions in the trades for which they cater. Even during the great depression of 1930's, a few foundries were so busy that they were forced to augment production by outside purchases. The industry is—as it always was—at a cross-roads. Recent developments are finding new avenues of activity, not involving greatly heavier tonnage production, but rather in the direction of the making of more expensive castings to a greater degree of perfection. Thus volume of production may no longer be a criterion of the value of the output. At the moment, business may not be too brisk, but it is at least realistic and forms a good basis upon which to build for the future. The earlier post-war conditions, when demand exceeded supply, provided quite unreliable data for intelligent market research. Finally, for this year to date, there is little indication that the 1954 production figures will differ materially from last year's showing.

Fifty-first I.B.F. Annual Conference

Detailed Arrangements for the Glasgow Meeting, June 22 to 26

The fifty-first annual conference of the Institute of British Foundrymen will be held at Glasgow from June 22 to 26, inclusive. This year the conference is being organized by the Scottish branch of the Institute, and Mr. John Bell, honorary secretary of that branch, will be installed in the office of president of the Institute during the conference. Glasgow is the heart of industrial Scotland and the committee has therefore had an easy task in arranging, with the co-operation of the respective managements, a series of exceptionally interesting visits to the important engineering works and foundries which abound in the area. The stranger to Glasgow, however, should not be misled into believing it is without other attractions. Apart from the pleasant, lively city centre, the unrivalled scenic splendour of the Trossachs is within ready reach and for those who have a little more time to spare the frowning precipices of Glencoe and lovely Deeside, with its forested uplands, can be visited. The conference will be extended by one day so that members and ladies may enjoy a river trip on the Firth of Clyde. The branch has formed a reception committee of prominent industrialists, of which the Rt. Hon. Lord Bilsland, M.C., D.L., LL.D., is president.

Conference Office.—A conference office will be established on June 22 in the rooms of the Institution of Engineers and Shipbuilders in Scotland, Elmbank Crescent, Glasgow. Communications prior to this date should be addressed to the Institute's head office, St. John Street Chambers, Deansgate, Manchester, 3.

Programme

Tuesday, June 22

7.30 p.m. to 11.30 p.m.: Reception by the Rt. Hon. the Lord Provost and magistrates of Glasgow at the City Chambers, Glasgow, followed by dancing in the Banquetting Hall and a concert in the Council Chamber. Light refreshments (members and ladies; evening dress preferred).

Wednesday, June 23

9.15 a.m.: Annual general meeting. In the Rankine Hall of the Institution of Engineers and Shipbuilders in Scotland, Elmbank Crescent, Glasgow (members only). Presentation of awards.

10.45 a.m.: Adjourn for coffee.

11 a.m.: Presidential address by John Bell.

11.30 a.m.: Edward Williams Lecture, "Engineering Research Methods and Casting Problems," to be delivered by Prof. A. W. Scott, B.SC., PH.D., A.R.T.C., M.I.MECH.E.

12.45 p.m. for 1 p.m.: Luncheon in the Grosvenor Restaurant, Gordon Street, Glasgow (by invitation of the Scottish branch) (members and ladies).

2.30 p.m.: Technical sessions in the rooms of the Institution of Engineers and Shipbuilders in Scotland, Elmbank Crescent, Glasgow.

7 p.m.: Reception in the Court Lounge, Central Hotel, Glasgow, by the president.

7.30 p.m. to 1 a.m.: Annual banquet at the Central Hotel, Glasgow, followed by dancing (buffet; evening dress, decorations).

Thursday, June 24

9.30 a.m.: Technical sessions in the rooms of the Institution of Engineers and Shipbuilders in Scotland, Elmbank Crescent, Glasgow.

10.45 a.m.: Adjourn for coffee.

12.45 p.m. for 1 p.m.: Luncheon in the Grosvenor Restaurant, Gordon Street, Glasgow.

Members may select one only of the following visits. Depart by motor coach from Grosvenor Restaurant, Gordon Street, Glasgow, for:—

2 p.m.: (1) Glenfield & Kennedy, Limited, Low Glencairn Street, Kilmarnock (hydraulic engineers and founders); tea by invitation of the company; arrive at Gordon Street, Glasgow, on return about 6 p.m.

2.5 p.m.: (2) Clyde Alloy Steel Company, Limited, Craigneuk Works, Flemington, Motherwell (alloy steels and steel castings, heat-treatment specialists); tea by invitation of the company; arrive at Gordon Street, Glasgow, on return about 6 p.m.

2.10 p.m.: (3) Shanks & Company, Limited, Tubal Works, Barrhead, Renfrewshire (baths and general sanitary castings); tea by invitation of the company; arrive at Gordon Street, Glasgow, on return about 5.45 p.m.

2.15 p.m.: (4) Harland & Wolff, Limited, Clyde Foundry, Govan, Glasgow (marine and land-engine castings); tea by invitation of the company; arrive at Gordon Street, Glasgow, on return about 5.30 p.m.

2.20 p.m.: (5) Renfrew Foundries, Limited, Hillington, Glasgow, S.W.2 (light-alloy founders and die-casters); tea by invitation of the company; arrive at Gordon Street, Glasgow, on return about 5.30 p.m.

Evening Entertainments. Parties of members and ladies will visit one only of the following:—King's Theatre, Empire Theatre, or Pavilion Theatre. Blocks of seats at these theatres are being reserved, and details will be announced later. Members will be able to book their seats on application at the conference office.

Friday, June 25

9.30 a.m.: Technical sessions in the rooms of the Institution of Engineers and Shipbuilders in Scotland, Elmbank Crescent, Glasgow.

10.45 a.m.: Adjourn for coffee.

12.45 p.m. for 1 p.m.: Luncheon in the Grosvenor Restaurant, Gordon Street, Glasgow.

Members may select one only of the following visits. Depart by motor coach from Grosvenor Restaurant, Gordon Street, Glasgow, for:—

2 p.m.: (6) G. & J. Weir, Limited, Argus Foundry, Thornliebank (iron and non-ferrous foundry) and Holm Foundry (engineering works and foundry), Cathcart, Glasgow, S.4; tea by invitation of the company; arrive at Gordon Street, Glasgow, on return about 5.45 p.m.

2.10 p.m.: (7) John Lang & Sons, Limited, Mary Street, Johnstone, near Glasgow (lathe manufacturers and ironfounders); tea by invitation of the company; arrive at Gordon Street, Glasgow, on return about 5.45 p.m.

2.15 p.m. (8) Babcock & Wilcox, Limited, Renfrew (engineers and boilermakers; iron and steel founders); tea by invitation of the company; arrive at Gordon Street, Glasgow, on return about 5.45 p.m.

2.20 p.m.: (9) Mavor & Coulson, Limited, Bridgeton, Glasgow, S.E. (engineers and manufacturers of conveyors and coal-cutting machinery); tea by invitation of the company; arrive at Gordon Street, Glasgow, on return about 5.45 p.m.

2.25 p.m.: (10) Wm. Beardmore & Company, Limited, Parkhead, Glasgow, E.1 (steelfounders; castings of very large weight); tea by invitation of the company; arrive at Gordon Street, Glasgow, on return about 5.45 p.m.

8 p.m. to 1 a.m.: Dinner/dance at the Grosvenor Restaurant, Gordon Street, Glasgow; display of Scottish country dancing; members and ladies (evening dress optional).

Saturday, June 26

9.30 a.m.: Cruise on the Firth of Clyde on the T.S. Queen Mary II. Depart from Bridge Wharf, Glasgow, at 9.30 a.m., cruising *via* Gourock, Cowal Shore, Rothesay Bay, Loch Striven and Loch Riddon, Kyles of Bute, Round Bute, Garroch Head, Loch Long and Loch Goil, returning to Gourock at about 6.30 p.m. The party will disembark at Gourock and return to Glasgow by special train. Lunch and tea on board the steamer. On the outward journey those who so wish may board the vessel at Gourock (the train from Glasgow draws up alongside the steamer), where it will call at 11.30 a.m. Members wishing to do so must indicate this on the reply form. The party will disembark on return journey at Gourock at about 6.30 p.m. Arrive at Glasgow on return journey about 8 p.m. (members and ladies).

Ladies' Programme

Tuesday, June 22

4 p.m.: Afternoon tea at Central Hotel, Glasgow, by invitation of Mrs. E. Longden.

7.30 p.m. to 11.30 p.m.: Reception by the Rt. Hon. the Lord Provost and magistrates of Glasgow, at the City Chambers, Glasgow. Dancing and concert; evening dress preferred.

Wednesday, June 23

Ladies may select one only of the following visits: depart by motor coach from the entrance to the Grosvenor Restaurant, Gordon Street, Glasgow:—

9.30 a.m. (1) J. Templeton & Company, Limited, Templeton Street, Glasgow, S.E. (carpet manufacturers).

9.35: (2) Birrell, Limited, Anniesland, Glasgow, W.3 (chocolate manufacturers).

9.40 a.m. (3) R. S. McColl, Limited, 142, North Woodside Road, Glasgow, N.W. (confectionery manufacturers).

9.45 a.m.: (4) City Bakeries, Limited, 37, Clarendon Street, Glasgow, N.W. (bakers and confectioners).

12.45 p.m. for 1 p.m.: Luncheon at the Grosvenor Restaurant, Gordon Street, Glasgow (by invitation of the Scottish branch) (members and ladies).

Afternoon free.

7 p.m.: Reception by the president in the Court Lounge, Central Hotel, Glasgow.

7.30 p.m. to 1 a.m.: Annual banquet at the Central Hotel, Glasgow (evening dress).

Thursday, June 24

9.15 a.m.: Depart by motor coach from the entrance to the Grosvenor Restaurant, Gordon Street, Glasgow, for excursion to Edinburgh, visiting the Castle, afternoon free in Edinburgh for shopping, etc., and returning to Glasgow, arriving about 6.45 p.m.

For evening entertainment: parties of members and ladies will make one only of the theatre visits.

Friday, June 25

10.30 a.m.: Depart by motor coach from the entrance to the Grosvenor Restaurant, Gordon Street, Glasgow, for excursion to the three lochs (Loch Lomond, Loch Long, Gareloch). Luncheon and tea *en route* and returning to Glasgow about 5.0 p.m.

8 p.m. to 1 a.m.: Dinner/dance at the Grosvenor Restaurant, Gordon Street, Glasgow. Display of Scottish country dancing (evening dress optional).

Saturday, June 26

9.30 a.m.: Cruise on the Firth of Clyde on the T.S. Queen Mary II (details as for members' programme).

Papers

Wednesday, June 23

2.30 p.m. to 5 p.m.: Two simultaneous sessions.

Session A. (Rankine Hall, in the rooms of the Institution of Engineers and Shipbuilders in Scotland, Elmbank Crescent, Glasgow):—No. 1089, Interim Report of Sub-committee T.S. 43—Cupola Developments. No. 1090, "Design and Working of a Modified Cupola," by F. A. Woolley (member). No. 1091, "Cupola Practice—Second Thoughts," by W. Y. Buchanan (member).

Session B. (Small hall in the rooms of the Institution of Engineers and Shipbuilders in Scotland, Elmbank Crescent, Glasgow):—No. 1092, "Theory, Economics and Practical Applications of Exothermic Materials," by D. V. Atterton, M.A., PH.D. (associate member) and R. C. Edmonds. No. 1093, "Production of Malleable Cast Iron," by J. Bernstein, A.R.I.C., A.C.T. (member).

Thursday, June 24

9.30 a.m. to 12.30 p.m.: Two simultaneous sessions.

Session C. (Rankine Hall.) No. 1094, "Application of the Dietert Process of Moulding in the Foundry," by H. W. Dietert (exchange paper from the American Foundrymen's Society). No. 1095, "Metallic-arc Welding of Spheroidal-graphite Cast Iron," by F. A. Ball, B.SC., A.C.T.(BIRM.) and D. R. Thorneycroft, B.SC., A.C.T.(BIRM.).

Session D. (Small hall.) No. 1096, "Defects in Vitreous-enamelled Castings," by E. R. Evans, A.C.T.(BIRM.). No. 1097, "Die-pressing of Gutters," by R. S. M. Jeffrey, B.SC., F.R.I.C. (member), and J. A. Richards (member).

Friday, June 25

9.30 a.m. to 12.30 p.m.: Two simultaneous sessions.

Session E. (Rankine Hall.) No. 1098, "Simple Foundry Expedients proved Worthwhile in Recent Years," by J. E. O. Little (member). No. 1099, "Production of Heavy Steel Castings," by S. Taylor (associate member), and film. No. 1100, "Causes and Prevention of Pinholes in Brass Castings," by B. Rutherford, B.SC.

Session F. (Small hall.) No. 1101, "Centrifugal Method of Metallurgical Research into Cast Iron," by R. V. Riley, PH.D., B.SC., F.I.M. (member), and H. T. Gillyatt. No. 1102, "Solution of Hydrogen in Iron/Carbon Alloys," by T. Evans, F.I.M., and B. G. Davies, PH.D. No. 1103, "Correlation of the Properties of Castings and Test-bars in Grey Cast Iron," by Erik O. Lissell, M.SC. (member), and M. Itzel, M.ENG.

Applications for hotel accommodation should be made as soon as possible direct to the hotel and not to the Institute. It is desirable that all hotel accommodation should be booked by May 22. It is essential that hotel bookings should be made on a hotel booking form provided by the Institute; otherwise the application will be rejected. A large proportion of the accommodation available consists of double- and twin-bedded rooms. Members who can share rooms with others, therefore, will assist greatly by doing so. The last day for receiving conference reply-forms (at the Manchester office of the Institute) is May 29.

THE GERMAN INDUSTRIES FAIR is being held at Hanover from April 25 to May 4. Details of the exhibition are available from the official agents, Schenkers, Limited, 27, Chancery Lane, London, W.C.2.

National Society of Master Patternmakers

An important meeting is to be held at the Queen's Hotel, Birmingham, on April 8, at 2.0 p.m. At this meeting the "objects and rules" which have been drawn up by the steering committee of the National Society of Master Patternmakers will be submitted for approval or amendment. If and when passed, founder members will be enrolled and the officers elected. As this will be a historic occasion, a group photograph will be taken of the assembly. Copies of the proposed "objects and rules" are available from Mann, Judd & Company, 8, Frederick's Place, London, E.C.2. Looking back over the history of the now-well-established associations, founder members are always accorded special honour and, as this has every promise of being the last of the pre-formation meetings, master patternmakers in their own interest should make a special effort to attend.

Chemical Industry and the B.I.F.

Over recent years there has been a decline of interest among exhibitors in the chemical section of the British Industries Fair at Olympia. As a result, the Association of British Chemical Manufacturers is giving thought to what should be the industry's future policy in regard to national exhibitions. Two committees have been set up—one to examine and report upon the feasibility of promoting separate specialized exhibitions for the industry; the other to review what form the industry's representation should take if it is decided to continue to take part in the B.I.F. either at Olympia or Birmingham. In the meantime, it has been decided not to exhibit at the Olympia section of the B.I.F. this year. The possibility of exhibiting experimentally at Birmingham has, however, arisen, and it has been decided to have an A.B.C.M. stand at Castle Bromwich, on which twenty of the leading chemical companies will have separate display units.

Slight Rise in Unemployment

A total of 387,300 unemployed registered on February 15 showed an increase of 14,400 since January 11, according to figures published by the Ministry of Labour and National Service. The total included 60,155 married women. The number temporarily stopped was 22,000, and 152,200 had been unemployed for more than eight weeks.

The number of unemployed was 1.8 per cent. of the estimated total of employees, the same as in January, compared with 2.1 per cent. in February, 1953. Highest percentage rates were 3.5 in Scotland and 3.2 in Wales. The Ministry estimates that the total working population increased by nearly 20,000 during January.

Dinner

SCOTTISH BRANCH

The annual dinner of the Scottish branch of the Institute of British Foundrymen was held on March 13 at the Grosvenor Restaurant, Glasgow, under the presidency of Mr. John Cameron, Jun. Amongst those at the high table were Mr. E. Longden; Mr. J. H. Calder Macleod; Bailie W. W. Findlay; Capt. Q. H. Paterson, D.S.C., R.N.; Mr. W. Rennie, J.P.; and Mr. T. Makemson, M.B.E. The company was entertained by a cast of artistes which included Mr. J. C. Dorsie. The organization was in the capable hands of Mr. A. Marshall.

C.F.A. Changes

At the annual meeting of the Council of Ironfoundry Associations in London, Mr. N. P. Newman was re-elected chairman, and Mr. Leonard Gould, Mr. F. D. Ley and Mr. H. V. Shelton were re-elected vice-chairmen. The Council is the organization representing the various regional and functional associations of iron-founders in matters other than the wages and conditions of labour. The Council is one of the two bodies (the other being the representative of the makers of foundry pig-iron—the Council of Iron Producers) forming the Joint Iron Council, which speaks for the iron industry on matters of common concern to the two constituent Councils. Mr. T. Lee resigned from the executive committee on the grounds of ill-health, and Mr. A. D. Mackenzie, O.B.E., B.SC., was elected to fill the vacancy. The two retiring members of the executive committee, Mr. Arthur Watson and Mr. D. Graham Bisset, were re-elected.

Factory Equipment Exhibition

The second National Factory Equipment Exhibition was held from March 22-26, in the Royal Horticultural Society's Halls, Westminster, London. The exhibition was well attended and had much to interest the modern business man—from automatic systems to simplify office work to mechanical-handling equipment for the workshops. In this latter field an interesting display by Teleflex Products, Limited, showed cable and chain conveyors and remote-controlled air-duct systems. For the welfare of employees there were barrier creams, paper towels, soap dispensers and many types of protective clothing. The Department of Scientific and Industrial Research had an interesting display on the prevention of fire, "good-housekeeping" being stressed as one of the chief factors in avoiding such risks.

Proposed Shell-moulding Association

A meeting will be held at the Queen's Hotel, Birmingham, on Wednesday, April 14, commencing at 2.15 p.m., when the question of the formation of a shell-moulding association will be discussed. The agenda will include:—(1) To elect a chairman to act until the association is actually formed; (2) to consider the desirability of calling a general meeting of all founders interested in shell moulding and the arrangements therefor; (3) to agree, in principle, the main objects of the proposed association for submission to this meeting; and (4) to receive a report from patent agents. Readers interested in this development are invited to communicate with Heathcote & Coleman, 69, Harborne Road, Birmingham, 15.

Forty Years Ago

Those interested in the early history of ironfounding will find much of interest in the JOURNAL of April, 1914. Mr. H. B. Wheatley, in an errudite paper presented to the Royal Society of Arts gives details of real interest to research workers. Strange though it may seem, this issue contains a well-documented article on the effect of oxygen on cast iron. The percentages recorded go from 0.009 to 0.065 per cent. of oxygen and, moreover, the openness of the grain of the iron was correlated with the oxygen content. It is reported that Mr. A. O. Backert had succeeded Dr. Moldenke as secretary-treasurer of the American Foundrymen's Association.

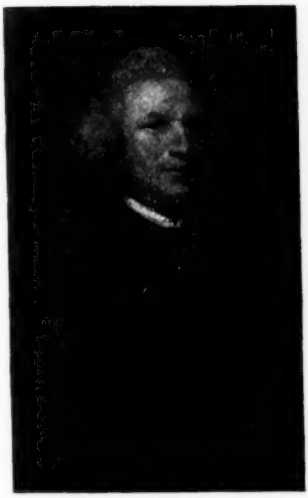
Royal Society of Arts

"For the encouragement of arts, manufactures and commerce"

Bicentenary Celebrations

H.R.H. THE DUKE OF EDINBURGH, K.G., president of the R.S.A., writes:—

The Royal Society of Arts is essentially a forward-looking body. By active origination, practical example, and wise exposition it has led the way for 200 years towards advancement in many familiar and practical aspects of life. Now, at its bicentenary, it is entitled to look back for a moment and review the way it has trodden and the paths it has opened up. . . . By its persistent and unobtrusive activities the Society has been an agent behind many notable developments, the good effects of which are felt to-day, but it has always tended to do good by stealth, and its great achievements are far too little known.



William Shipley, founder and first secretary of the Society of Arts.

The bicentenary of the Royal Society for the Encouragement of Arts, Manufactures, and Commerce is being celebrated this year. It originated through the enterprise of an obscure drawing master at Northampton, William Shipley, who conceived the idea that industry should be stimulated by prizes drawn from a fund contributed by public-spirited people. Failing to obtain support for his scheme locally, Shipley went to London and succeeded in interesting a few prominent men. The society was founded at a meeting on March 22, 1754, and Shipley became its first secretary; by 1762 its membership had risen to over 2,500.

For many years the method of "encouragement" on which the Society chiefly relied was the offer and award of premiums, which achieved remarkable and far-reaching results in the relatively simple economy of the 18th century. In the first hundred years of its existence the society spent over £100,000 in promoting arts, manufactures, and commerce by means of prizes and medals. The selection of suitable objects for the offers of premiums, and the adjudging of the awards, constituted almost the sole business of its meetings for many years, and during the earlier part of the 19th century its annual prize-giving was among the major social events of the season.

About 1825, it became clear that the offer of premiums was becoming a less effective form of "encouragement," and that inventors could best be assisted by giving them opportunities for publicity. Hence the practice was instituted of holding meetings at which new scientific discoveries and their applications could be described and discussed. There were few prominent technical and scientific discoveries during the 19th century whose introduction to public use was not assisted in this way.

In a letter, written in 1762 and still preserved in the society's archives, the famous Shropshire ironmaster, John Wilkinson, stressed the need for a process applicable to British ores whereby high-quality pig-iron could be produced by the use of coke. By that time coke was already being used in the production of low-grade iron, but the secret of using it for high-grade pig had not yet been discovered, and the quantity of charcoal required for that purpose was prohibitive. All Britain's requirements for high-grade metal had, therefore, to be imported. The society followed up Wilkinson's suggestion by making two offers, one for the production of at least 100 tons of high-grade pig, or cast-iron with coke, and the other for at least 10 tons of bar, or forged iron, also with coke. Although the premiums amounted in each case to £150, neither of them was claimed. As was pointed out at the time, only the proprietors of the larger works were in a position to carry out the research and development required and the commercial incentives were much greater than the prizes offered.

The Society proved more successful in its efforts to encourage the utilization of iron, for in 1788 a gold medal was awarded to Abraham Darby for the iron bridge he built over the Severn, near Coalbrookdale, which was the first iron bridge ever to be constructed. The beautiful model which Darby presented to the society is now in the Victoria and Albert Museum.

One of the Society's most important objectives in the early days was to reduce Britain's dependence on other countries for supplies of important raw materials. In accordance with this policy, a number of awards were offered for the discovery of various ores, among them being manganese and chrome-ironstone. Manganese was found in 1804 near Aberdeen, and in 1820 an award was made to Dr. Hibberd for the discovery in Shetland of an occurrence of chrome-ironstone, which at that time was

The emblem of the Royal Society of Arts.

extensively imported from America for the manufacture of pigments.

When the society was founded, Britain's most important possessions overseas were those on the mainland of North America. A Committee of Colonies and Trade was soon established, and in 1761 its chairman was none other than Benjamin Franklin, who was a most enthusiastic supporter of the society. Awards were offered to help the colonies either by encouraging the introduction there of new industries, or by promoting the export of colonial products to Britain. The only connection between the society and the manufacture of iron in America seems to have been the offer of a prize for making iron from "black sand" (magnetic oxide of iron); although the offer was a reasonable one, the solution of the problem was far beyond the metallurgical knowledge of the time. Nevertheless, a gold medal was awarded in 1763 for the manufacture of malleable iron from American "black sand."

One of the most important factors in the early development of modern industrial chemistry was the pioneer study of the constituents of coal and coal tar, with which the society was early associated In 1768, it offered a prize for "destroying smoke" from factory chimneys, and this led in 1781 to the publication of an article by William Pitt, of Pendeford, near Wolverhampton, who claimed that the answer to this problem lay in the collection of the solid matter, including the tar, by condensation on the walls of the chimney. This process was already in operation in connection with coke ovens erected in at least three places in the Black Country, and the properties of tar, which thus began to be obtained in bulk, were soon investigated.

A prize offered in 1797 for a "substitute" for tar seems to have attracted no competitors, although it remained open for many years. In 1810, however, B. Cook was awarded a silver medal for a paper which described a process for the distillation and utilization of gas tar, which he termed "a waste product." The paper described a method of distilling the tar, from which a "liquor or volatile oil" (light oil) was obtained, together with a "residuum (pitch) equal to the best asphaltum."

Among the Society's most notable awards was the presentation in 1808 of a silver medal to Samuel Clegg for his apparatus for making carbonated hydrogen gas from pit coal and lighting factories with it. The apparatus included a gasholder of the form now generally used, which was apparently invented by Clegg. Another of Clegg's inventions was the gas meter, which was not submitted to the Society, probably because it had been patented. In 1818, a gold medal was given to John Malan for improvements on Clegg's original meter.

The first public announcement of the manufacture of calcium carbide on a commercial scale was made in a paper entitled "The Commercial Synthesis of Illuminating Hydrocarbons," which was read to the society by Vivian Lewes in January, 1895. A series of Cantor lectures on the same subject was given by Lewes a few years later. As an indication of the leading part played by the Society in developing the production and utilization of acetylene, it is noteworthy that in 1868, having decided to hold an exhibition of acetylene generators, the Imperial Institute asked the Society's council to appoint a committee to test the safety of apparatus submitted for exhibition. The council agreed to do so, and 26 models approved by this committee were operated at the exhibition. Subsequently, the committee was asked to continue its investigations by submitting all the accepted lamps to a month's trial, these additional tests being in-

The Society's Headquarters in John Adam Street.

corporated in what was presumably the first comprehensive report on this subject.

Since the second world war much research has been devoted to problems associated with the more efficient utilization of solid fuel. The Society's interest in this subject goes back to 1873, when an anonymous donation of £500 enabled some very interesting experiments to be carried out. The donor's intention was to encourage the development of means for the more economical use of fuel in domestic stoves. Over 200 competitors replied to an invitation to participate in the experiments. Six rooms, each 15 ft. cube, were erected in concrete, and facilities were provided in each one for fitting the stoves to be tested. The very elaborate series of tests included careful temperature tests of air in different parts of the room and chimney, measurement of chimney draft and of air entering the room, and hygroscopic tests for the amount of moisture in the air at different stages of the experiments. No actual cooking tests were made, but the time to raise a measured quantity of water to boiling point was determined for all the cooking stoves and careful thermometer tests of the temperature of the ovens were also made.

Among the Society's greatest triumphs was the abolition of the practice of using boys for sweeping chimneys, which was made possible by its introduction of the sweep's extending brush.

The Society has also made important contributions to coal-mining technology, and has done much to improve working conditions underground. A gold medal and 100 guineas were awarded to James Ryan in 1816 for an improved ventilating system. Dr. Clanny, the first person to provide miners with fairly good and safe light, was awarded a gold and a silver medal. A large silver medal and 50 guineas were awarded in 1825 to John Roberts for a device embodying all the principles of the modern gas mask. It was invented by Roberts for protection against the hot and acrid fumes of the great fires which used to burn at the foot of pit shafts to induce ventilation of the mine.

The Society holds lectures and meetings, organizes exhibitions, fosters industrial design, and is probably the largest examining body of commercial subjects and modern languages in the world.

Presswork and its Problems

The Sheet and Strip Metal Users' Technical Association will be holding its spring meeting on Tuesday, April 6, at the Engineers' Club, Manchester. Admission to technical sessions is by ticket only. At 2.30 p.m. are works visits to A. V. Roe & Company, Limited, or General Gas Appliances, Limited, while at 6.45 p.m. will be held the technical session. This will take the form of a discussion forum on "Presswork and its Problems," at which technical questions will be answered by a panel of experts comprising Mr. T. Elkington, Peter Brasshouse, Limited; Mr. S. W. Froud, Joseph Lucas, Limited; Mr. D. Lloyd and Mr. S. Neville, Fisher & Ludlow, Limited; Mr. E. N. Salmon, the Austin Motor Company, Limited, and Mr. H. A. Snow, Edgar Vaughan & Company, Limited.

South Wales Needs Better Communications

If South Wales is not to be strangled industrially, road communications will need to be drastically altered. This was emphasized by Mr. H. E. Aldington in a paper he presented to the South Wales Institute of Engineers. Strong industrial ties existed between the Midlands and South Wales, he said. Midlands firms had established branch factories, and large quantities of raw materials, notably tinplate, steel sheet, and strip, had also to be transported from South Wales to the Midlands. Ninety-seven per cent. of the country's total output of tinplate originated in South Wales. In addition to being an isolated area geographically, South Wales was also handicapped in its internal communications by "bottlenecks," level crossings, weak bridges, and bridges with insufficient headroom—all seriously interfering with the free flow of industrial traffic.

Outlining Ministry of Transport proposals for improving road connections between Wales and the Midlands and the west of England, Mr. Aldington referred to the suspension bridge over the Severn, which, when built, would be the largest in Europe. He also mentioned development which would provide an unobstructed run for traffic into the Swansea docks and town areas.

The limitations of docking facilities at Swansea were also discussed at the annual luncheon of the Swansea and District Industrial Life Offices Committee, when it was stated that the advent of larger tankers and cargo boats might mean the end of the town's prosperity as a port owing to the "bottleneck" at the existing dock entrance. It was pointed out that Swansea's share of trade and business was capable of great expansion owing to the proximity of Margam, Tostre, and Velindre. At present, however, the town's remuneration lay in its cargo traffic at the docks.

B.I.S.R.A. Retirement

The British Iron and Steel Research Association has now to find a successor to Dr. H. L. Saunders as head of its ironmaking division. Dr. Saunders, who has been in charge since the establishment of the division in 1945, is to retire at the end of this month because of ill-health.

Dr. Saunders graduated from Liverpool University; research in physical chemistry was followed by a university Fellowship and the degree of Ph.D. in 1924. During this period he worked on thermal decomposition, vapour pressure, salt pair systems, and photo-synthesis. In 1925, Dr. Saunders went to Imperial College, London, to study the mechanism of blast-furnace reactions, with the financial backing of the National Federation of Iron and Steel Manufacturers (later the Iron and Steel Industrial Research Council). Although he occasionally extended his activities to the fields of spectroscopy and gaseous combustion, his interest was mainly devoted to the smelting of iron. He was appointed special lecturer in thermometallurgy at Imperial College in 1939, and there built up a research team to work in the blast-furnace laboratory.

This work was transferred in 1945 to B.I.S.R.A. and Dr. Saunders became head of the newly formed ironmaking division, investigating a variety of problems associated with iron extraction, sintering, distribution of materials in the furnace, optimum ore sizing, an experimental blast furnace, and similar projects.

Parliamentary

Recruitment of Technological Students

In the universities, the number of full-time students taking technological courses (other than architecture) in October last was the same as in October, 1952. MR. R. A. BUTLER, Chancellor of the Exchequer, made this statement when replying to MR. MALCOLM MACPHERSON, who asked the Chancellor whether he was aware that recruitment of students for technological courses in universities and technical colleges was flagging, and by what means he proposed to stimulate it, bearing in mind the continuing need to increase the numbers of students taking such courses.

MR. BUTLER also said that the additional assistance which he proposed to give for the development of further facilities would, he hoped, help to stimulate recruitment. In the technical colleges, there had been no significant change. The Ministers concerned were fully aware of the importance of the question.

When MR. MACPHERSON asked if the Chancellor was aware that at a recent conference the head of one of the most important technical colleges used this phrase: "Recruitment of students for technological courses is flagging," and would the Chancellor see that more effort was put behind this programme than in the past year, MR. BUTLER replied: "I certainly think it is right to put every effort behind the programme and to pay attention to any observations made by the head of any such college."

Machine-tool Deliveries

When Civil supplementary votes were debated in the House of Commons recently it was revealed that a mistake of over £10,000,000 in estimates for machine tools had been made. This was said to be due to insufficient provision for price increases.

MR. A. R. W. LOW, Parliamentary Secretary to the Ministry of Supply, recalling that the last Government had placed orders for tools overseas, said it was estimated that at least 20,000 machine tools manufactured in Britain had been installed in Government contractors' works for use in defence production since 1950.

Up to the end of last year 18,618 machine tools had been or were being supplied from overseas, of which total 6,224 were from the U.S. and Canada and the rest from Europe. The cost had been estimated at just over £116,000,000, but prices had risen by over 20 per cent. since the orders were placed and the Ministry was asking for a vote of £10,800,000, the major part of which was required to meet the increased cost of the oversea orders.

The vote was approved without a division.

THE MINISTER OF LABOUR assured Mr. Janner that he would co-operate with the new Safety Committee established by the Council of Ironfoundry Associations.

PROPOSALS for making the City of London a smokeless zone were opposed by property owners when the City of London (Various Powers) Bill was discussed by a committee of the House of Commons on March 23. It was contended in a petition that the proposed new laws would impose an unreasonable burden on property owners.

IN A WRITTEN ANSWER the President of the Board of Trade stated that exports to Japan in 1953 of textile machinery of all kinds were valued at £569,000. The trade statistics did not distinguish all textile machinery

(*Continued at foot of col.* 2)

Iron and Steel Import Licensing Changes

The Board of Trade announces that the following types of finished or semi-finished iron and steel can now be imported under open individual licence, instead of under specific licence, from all countries except those specified in Notice to Importers No. 637:—

Blooms, billets, and slabs. Girders, beams, joists, and pillars whether fabricated or not. Angles, shapes, and sections whether fabricated or not. Bars and rods other than the following:—Rods not exceeding 0.6 in. dia., in coils weighing not less than 1½ cwt., of steel made by the acid open-hearth process containing by weight the following: Carbon, not less than 0.55 per cent.; sulphur and phosphorus together, not more than 0.05 per cent.; silicon, 0.1 to 0.25 per cent.; other elements (other than iron), not more than 0.1 per cent. Plates, sheets, and strip, cold rolled or cold reduced not exceeding 18 in. in width, but not including bandsaw strip 3 in. wide or over and from 19 to 12 gauge (B.W.G.) in thickness. Plates, sheets, hoop, and strip, if plated, coated, clad, drilled, or punched.

Applications should be submitted on Form I.L.B./A. to the Import Licensing Branch, Board of Trade, 43, Marsham Street, London, S.W.1. Licences will be valid, in the first instance, from the date of issue until December 31, 1954.

The Board of Trade also announces that with effect from April 7 the following products will be admissible under open general licence from any country or territory other than those listed in Notice to Importers No 637:—Fittings, wrought, of iron and steel, for pipes and tubes. Railway and tramway track construction material of iron and steel, the following:—Bumping posts, turntables.

Iron-ore Imports

Iron-ore imports in February and the total for the first two months of this year compared with the corresponding period of 1953 are shown below.

Country of origin.	Month ended February 28.	Two months ended February 28.	
	1954.	1954.	1953.
	Tons.	Tons.	Tons.
Sierra Leone	43,175	112,039	87,218
Canada	39,055	133,830	88,785
Other Commonwealth countries and Eire	50	1,112	4,087
Sweden	329,874	639,031	443,866
France	37,483	81,112	75,574
Spain	35,876	60,173	92,306
Algeria	153,091	318,081	281,194
Tunis	33,320	65,746	77,520
French Morocco	24,130	40,057	29,148
Spanish Morocco	20,750	38,833	40,620
Liberia	26,339	35,789	65,010
Brazil	25,110	43,865	17,403
Other foreign countries	85,095	162,823	45,992
TOTAL	853,348	1,732,491	1,348,703

according to the material on which it was used, but the bulk of the exports to Japan were of machinery for textiles other than cotton. He expected that our exports to Japan of machinery in general to be well maintained in 1954, but he could make no estimate of the proportion which would be cotton textile machinery.

New Equipment

Briquetting Press for Swarf Recovery

Fielding & Platt, Limited, hydraulic engineers, Gloucester, who for many years have played a prominent part in scrap-metal recovery by the manufacture of scrap-metal baling presses, realizing that there is also a potential demand in industry for equipment designed to assist in the conservation of ferrous and non-ferrous materials of the swarf type, have therefore now introduced a briquetting press for this class of material. It is a 400-ton power/hydraulic unit of new design, fully automatic in operation, and capable of converting fine cast-iron borings into high-density briquettes at a constant and rapid production rate. The process needs no bonding or sintering, and the briquettes, when made, can be conveniently handled and conveyed direct from the press to the cupola or other furnace for re-melting.

Cast-iron borings have received much attention in the past, and methods for their utilization have received mixed reception at the hands of practical founders. Recovery has sometimes been a difficult and uneconomical problem, mainly because of furnace losses when charging loose material into cupolas. The briquetting press shown in Fig. 1 is put forward as a serious contribution to cast-iron swarf recovery, as the briquettes produced have a density of approximately 85 per cent. of cast-iron scrap. They can form a suitable substitute for scrap iron, with only small losses due on melting. The advantages of using cast-iron briquettes of known and uniform composition are obvious, not least being the reduction in final metal cost.

Machine Details

The press is of the vertical four-column type, having fabricated tables with a mould assembly mounted on the bottom table. It is self-contained and complete with its own hydraulic pumping unit, using oil as the pressure medium. It has been designed for producing briquettes in suitable sizes and forms from cast-iron borings, but with some modifications it may be adapted for producing briquettes from non-ferrous machinings, such as brass and aluminium. The press conforms to the following principal characteristics:—Power of main ram, 400 tons; stroke of main ram, 15 in.; specific pressure on material, 48 tons per sq. in.; output of press, *circa* five to six briquettes per min.; total time cycle, *circa* 11.5 secs.; weight of briquettes, 4 to 6 lb.; average density, 85 per cent. *circa;* output per hour, *circa* 300 to 340 briquettes; and tonnage per hour, *circa* 0.7 to 0.9 tons. The control of the machine is by electrical push-buttons through d.c., solenoid-operated valves which are of the balanced type for operating with oil, complete control equipment being arranged for automatic operation. The oil pressure medium is supplied from two high-speed radial pumps driven from one 80- and one 50-h.p. motor.

Method of Operation

In use, swarf is loaded into the bunker, which has a capacity of about 1 ton; based on the production of briquettes, shown in Fig. 2, weighing 4 to 6 lb. each, this represents storage capacity for approximately one hour's working. From the bunker the swarf pours on to a vibrating screen which will reject large pieces or other unsuitable material, which will then be carried away down the small chute fitted at right angles to the direction of flow. A suitable receptacle is placed under this chute. The screened material then passes into the reservoir at the foot of the elevator, from which it is carried to the small hopper at the top of the machine by flights attached to the elevator chain. A vibrator attached to this hopper ensures a continuous supply of swarf into the dispenser. This latter is a device for measuring by weight the correct amount of swarf required to make one briquette. After filling, it is tipped by air cylinders to discharge its load down another chute and into the mould ready for briquetting. As soon as the swarf is discharged, the dispenser is immediately returned to its original position. The action of the dispenser is fully automatic and interlocked with the pressing cycle of the machine. Should the elevator deliver swarf faster than the machine can deal with it, an overflow pipe is fitted above the dispenser to return the surplus to the lower reservoir.

The main ram mandrel next enters the mould or container and presses a briquette. Pressure is then locked in the main cylinder, while the mould is lifted by four small lifting rams and the briquette is stripped from the mould. The main ram is then returned to the "up" or filling position, thus releasing the briquette completely, which is then ejected by the

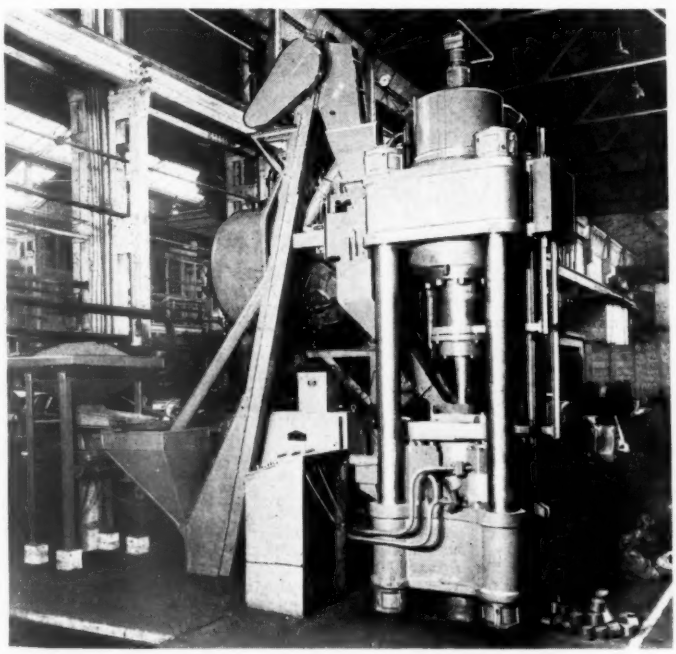


FIG. 1.—*Fielding & Platt 400-ton power/hydraulic briquetting press used for the conversion of cast-iron swarf into high-density briquettes.*

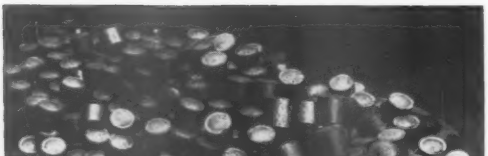


FIG. 2.—*High-density briquettes manufactured from cast-iron swarf by the power/hydraulic press. The 12-in. rule also photographed conveys an idea of their dimensions.*

plunger of a horizontal air cylinder. The finished briquette is then pushed down another small chute, where a suitable receptacle or conveyor is placed to receive it. The mould is then returned to the filling position, when the dispenser supplies a new charge of swarf as before and the sequence of operations is repeated.

"Adjusticon" V-belt and Fastener

Manufactured by Carol Beltings, Limited, an adjustable leather V-belt is now being marketed under the trade name of "Adjusticon." It is of multi-ply construction with flush, unbroken driving face, which provides an excellent grip, flexibility, and resilience. It is reinforced throughout by stainless, evenly spaced tubular metal eyelets, which serve to clamp the plies of the belt. By means of these eyelets and a specially constructed fastener, the belt can be easily adjusted for length and tension.

The fastener (Fig. 3) is held in place by a steel spring plate, and due to its short overall length and

FIG. 3.—*"Adjusticon" V-belt and fastener.*

the belt-ends abutting within the fastener, maximum flexibility and resilience are maintained. No metal parts come into contact with the pulley groove, and the locking device can only be released by manipulation.

The "Adjusticon" V-belt is made in standard sizes and is supplied in coils of from 25 ft. to 100 ft., with the respective sizes of fasteners.

Film Review

Stainless Steels in Power Production.—It is usual for companies wishing to present any aspect of their production as a sound film for publicity or educational purposes to commission a film company to produce the film. For a steel company itself to produce a film—in Kodachrome, with sound commentary—effectively combining technical and general interest—is a welcome and laudable achievement. Such a film is "Stainless Steels in Power Production," portraying the techniques and products of Firth-Vickers Stainless Steels, Limited. This 16-mm. film runs for about half-an-hour, and is available on loan to technical societies, etc. It was originally prepared for showing at a special meeting of the Institute of Welding, and consequently has an emphasis on welding techniques. The methods for producing the following items of plant are well featured:—Steam- and gas-turbine blades, aero-engine sleeve-valves, centri-die castings and machining of rings for jet engines, Diesel and motor-car valves, and hydro-electric plant. The methods used at the Sheffield works for melting, casting and working stainless steels are shown in some detail. T. B.

Die-casters Visiting America

Plants specializing in zinc and light-metal die-casting in many parts of the United States are being visited by a team of European technicians due to arrive in New York on March 30 aboard the Ile de France. The team comprises 34 specialists from 12 European countries, and their visit has been arranged under the O.E.E.C. Technical Assistance programme in agreement with the United States Foreign Operations Administration.

The tour has been organized as a result of a proposal discussed by the European Pressure-die-casting Committee set up last year by technical associations and principal firms in member countries to forward the interests of the industry. The application of American mass-production methods, which are very highly developed in this field, would be of great benefit to European productivity in many branches of industry. On conclusion of their six-weeks' visit to the United States, the team will prepare a report for publication by the O.E.E.C.; this report will form the basis of a conference to be organized by the Committee in the United Kingdom during October.

First Keith Lecturer

The first Keith Lecture on "New Metals," under the auspices of the Royal Scottish Society, was delivered by Dr. N. P. Allen, superintendent of the Metallurgy Division of the National Physical Laboratory, Teddington, in the Heriot-Watt College, Edinburgh, on March 22. Dr. Allen said that the manufacture on a commercial scale of the metals titanium and zirconium had been developed since the end of the war. Though previously regarded as chemical curiosities, these metals were actually very abundant, titanium ranking fourth in abundance of the metals usable in engineering.

Titanium, he declared, being superior to aluminium in resistance to heat and superior to steel in lightness, might well replace aluminium and steel for certain uses in the aircraft industry. Zirconium might prove to be essential in atomic reactors designed to produce a high output of electrical energy, and in this case it would assume great technical importance.

Income-tax Assessment Procedure

By F. J. Tebbutt

Income-tax assessment procedure is open to many changes, both by legislation and by administration (by successive Finance Acts) and in this article will be explained the most important alterations to date, inclusive of the provisions introduced by the Finance Act, 1953. Shortly, the familiar buff envelopes will be appearing in the post (a new year of assessment commences April 16) enclosing "forms of return" to be completed, for Schedule D (Business Profits; Persons on Own Account) concerning income for year ending April 15, 1954, or earlier date, according to the year ending date of the particular firm. Mostly, this article applies to Schedule D matters, although reference will be made to Schedule E (Employments: Pay-as-you-earn) matters where considered necessary.

Machinery and Plant; Depreciation Deductions

Depreciation amounts recorded in Company Balance Sheets are not acceptable for income-tax purposes, but there are amounts allowable for machinery and plant (a wide term including motor vehicles and fittings and fixtures) ordinarily called "wear-and-tear" allowances, which operate by yearly percentage allowances, varying according to the particular type of machinery, etc.; these being deducted from the assessment, and not treated as trading expenses in the accounts. In addition to these percentage allowances, called "agreed rates," there is an increase of a quarter of the particular rate, applying to all trades, as, for example, the ordinary rate for motor vehicles is 20 per cent., but in practice, with plus one-quarter, 5 per cent., the rate becomes 25 per cent. (the formula says five-fourths of the rate, thus five-fourths of 20 per cent.).

By the Income Tax Act, 1945 (provisions now included in the consolidated Income Tax Act, 1952), there was introduced an allowance called "the initial allowance" to apply where fresh machinery or plant (whether new or second-hand) was installed, but by the Finance Act, 1951, as regards any expenditure incurred on or after April 6, 1951, this was not to apply for these deductions, the provisions being suspended until such date as Parliament might decide otherwise. Parliament has now so decided as by the Finance Act, 1953; "the initial allowance" provisions are once again to operate, that is, for expenditure incurred on or after April 15, 1953, as regards machinery or plant, there is to be an "initial allowance" of 20 per cent. of the expenditure.

For new "industrial buildings" there was an "initial allowance" of 10 per cent., and this provision also was suspended, but the Finance Act, 1953, brings this back also (being 10 per cent.), the same as with machinery or plant. It might be added that for industrial buildings, for both new and "under 50-year-old" buildings, there is also an "annual allowance," this being 2 per cent. per annum for each year of a life of 50 years; this allowance was not interfered with by the Finance Act, 1951, and still applies.

Items Assessable and Otherwise

Until the Finance Act, 1952, profits-tax payments were deductible for income-tax assessments, but by that Act, for tax year 1951-52 and subsequent years, this was altered. Thus, now, profits-tax payments are not deductible for income tax, or income-tax payments for profits tax.

Bankers (and this applies to Post Office savings bank accounts), must on request give particulars of interest paid or credited to persons, names of recipients to be given and the amount of interest, in any specified year. This specified year cannot be one ending more than three years before the date of the request. The provision, however, does not apply if the interest amount in question does not exceed £15.

Expenses incurred or fees paid in obtaining the grant of a Patent or the registration of a design or trade mark (or for extensions or renewals) can be deducted as trading expenses for income tax, and by the Finance Act, 1952, expenses incurred where application for a Patent has been rejected or abandoned are similarly deductible. Furthermore, even though capital outlay, expenditure on purchasing Patent rights is deductible—but not all at once, the method being by yearly instalments spread over a period (ordinarily 17 years). The vendor, however, is assessed on the amount received, and this can be spread over a period of six years if the vendor so prefers, or it can go through as a charge in one year; this amount is assessed as "earned income" and so attracts the "earned income" allowance.

Authors of literary, dramatic, musical, or artistic work have for some time had a special spreading arrangement for tax payments. That is, if an author spent more than a year on a work, and he sells an interest in the copyright for a lump sum, he may claim that the lump sum be spread for tax purposes. By the Finance Act, 1953, this can apply in respect of royalties of the first two years after publication, in the same way as lump sums. Broadly, this means that if proper steps are taken, payments received will not be subject to tax payments to apply all in one year, but assessments can be made applying, for example, to half the amount in one year and half in another year.

In connection with scientific research, capital expenditure on such things as pilot plants, laboratories, etc., is allowable, but the deduction is spread over a period of five years. Originally, this was one-fifth deduction a year, but for expenditure incurred after April 5, 1949, the deduction is 60 per cent. for the first year, with 10 per cent. for each of the remaining four years of the five. Such items as salaries and fees of research workers, the cost of materials, repairs and maintenance, and so forth are allowable as trading expenses.

Interest received on Treasury Tax Reserve Certificates taken out in advance of tax payments is not chargeable with tax. Interest, however, may be charged where tax payments are outstanding three months after the due date for payment.

Setting-off Items

A person who carries on either solely or in partnership two or more distinct trades (this applies to a profession or vocation also) can, under Schedule D, set off against the profits in one or more trades any loss sustained in any other such trade. Separate statements can be made as to each trade. Furthermore, by the Finance Act, 1953, it is allowable to carry forward a business loss for one year and set off against *other* income. Up to the Finance Act, 1952, although a "loss" in business could be set off against future profits, this provision was restricted to a period of six years. By that 1952 Act, however, it has been provided that this limitation to a period of six years for such "set-offs" has no further effect. That is, losses can now be carried forward to use against profits indefinitely.

Wages, salaries, expenses, etc., paid to employees are, of course, allowable as trading expenses in connection with employers' assessments (Schedule D). But for directors and employees with emoluments of £2,000 per annum and upwards, if the remuneration is plus a lump sum for expenses, this must be included with the remuneration amount in the return of income for recipients' assessments under Schedule E. Ordinary expenses

Income-tax Assessment Procedure

incurred during the job are, however, allowable before tax, is paid, if claimed (Schedule E).

Contributions to charities are not ordinarily deductible as trading expenses, but if the charities are for the welfare of employees, they are, as also are contributions to trade charities and to employers' organizations, if these are associated with the particular trade. Furthermore, contributions, even of a capital nature made to colleges, universities, etc., in respect of technical education for the particular trade, are accepted as trading expenses. By the Finance Act, 1953, it is provided that if a company pays an amount to an associated company to make good a loss, that can be treated as a trading expense by the company paying, but it is a trading receipt by the recipient.

Labourer Loses Claim

Said to be totally unfit for work as a result of injuries sustained at work nearly three years ago, John Alfred Cox, aged 64, of Smethwick, claimed damages at Birmingham Assizes against his employers, Samuel Smith & Sons, Limited, Beehive Foundry, Smethwick. Mr. Geoffrey Green, for the plaintiff, said that the accident occurred on June 20, 1951, when Cox, because of steam in the foundry where he worked on sand preparation, climbed up a ladder to open a door above a stove to increase the draughts. The ladder, a wooden one, placed on four bricks to give it additional height, slipped sideways, causing him to fall. Cox, in the witness box, said that when the weather was hot and damp, his workmates would shout to him to open the door. There was no other way to open it but by climbing the ladder, and the ladder had been placed on the bricks by Cox and left in position for about three months. Just as he started to heave himself up, the ladder slipped and he was thrown down.

Three men employed by the firm at the time of the accident told how when water was poured on to the sand it gave off steam, which was carried away on a normal day, but hung about when the weather was humid.

John William Mortimer, works manager at the time, said he received no specific complaints from the men regarding extra ventilation. Asked if he would have allowed one of his workmen to use a ladder propped up on bricks to open the door, Mortimer said "No."

Giving judgment for defendants, Mr. Justice Pilcher said that plaintiff based his claim on the alleged breach of statutory duty of his employers and also alleged that there was an unsafe system of work. The plaintiff, he said, contended that it was in the ordinary course of his employment that he was climbing up this ladder and that this was an unsafe system. But the plaintiff's case rested on establishing the fact that he had developed a practice of using the ladder in such a fashion as to render his employers responsible for the system.

The Judge said he was satisfied that this foundry was "perfectly satisfactorily ventilated." "I don't accept that the plaintiff went up and down this ladder anything like as often as he said, and I don't accept that the ladder was left against the wall for a period of two or three months. I don't think the plaintiff had any business on the top of this stove."

A 71-TON CYLINDER, a fabricated section of an atmospheric tower for a new Australian oil refinery, manufactured by Edwin Danks & Company (Oldbury), Limited, started on its journey on March 19.

New British Standards Issued

Gas Masks and Dust Respirators

A new British Standard (B.S. 2091:1954) applies to canister respirators and dust respirators which give protection against only a limited range of hazards. It is intended that this standard shall be amplified from time to time as further knowledge becomes available. In its present form it covers hazards encountered principally in the petroleum industry, but many of the risks listed are to be found in other industries.

The standard specifies construction, marking and test requirements for canister respirators ("gas masks") affording protection against the limited concentration of the gases listed, against each of which is listed the respirator canister which will give protection or, alternatively, the recommendation to use breathing apparatus; it also specifies requirements for respirators ("dust masks") giving protection against dusts. It embodies recommendations in an appendix for dealing with other hazards beyond the scope of canister and dust respirators and describes suitable equipment.

Industrial Eye Protectors

British Standard B.S. 2092:1954 specifies the essential requirements for eye protectors suitable for common industrial operations; it extends and supersedes B.S. 955:1941, "spectacle-type goggles for protection against flying particles." It does not, however, deal with protection against harmful radiation, which is covered separately in B.S. 679, "protective filters for use in welding and similar industrial operations," in B.S. 1542, "equipment for eye and face protection during welding," and in B.S. 1729, "green protective spectacles and screens for steelworks operatives." Protection from glare is not covered (and may be an additional requirement); nor is reference made to face shields or screens.

The standard covers both heavy-duty eye protectors and light-duty eye protectors, the essential difference between the two being the requirements of the impact test specified in Appendix B. Attention is drawn to the fact that corrective safety lenses are available if required. Care has been taken to avoid any hindrance to the free development of equipment, and this standard will be revised whenever progress makes this necessary. The following types are covered:—Industrial spectacles; wire basket goggles; cup-type goggles; box-type goggles; chemical goggles; gas-tight goggles; one-piece eye protectors, and dust-tight goggles. The standard specifies requirements for essential points of design and manufacture, and materials used, and the mechanical strength of lenses and complete protectors; methods of testing are included. The standard also covers lenses for eye protectors supplied either assembled or separately.

Copies of these standards may be obtained from the British Standards Institution, 2, Park Street, London, W.1 (price 4s. net each).

Electrodeposition and Metal-finishing Conference

The fourth international conference on electrodeposition and metal finishing will be held in London, April 20 to 24, under the ægis of the International Council for Electrodeposition. Over 24 papers will be given on metal-finishing subjects. An exhibition of recent advances and developments in electrodeposition and metal-finishing techniques and equipment will be held relating to the papers. Further details may be obtained from the conference secretary, Institute of Metal Finishing, 32, Great Ormond Street, London, W.C.1.

Centrifugal Casting on the Continent

Details of Some Current Practices

The applications of centrifugal casting, originally developed for the production of so-called cast-iron "spun pipe," have of late years considerably extended, as most of the initial difficulties attaching to the process, such as the separation by centrifugal action of the constituents of certain classes of alloy, have been overcome. Certain inherent advantages of the method are now so apparent that it is used for casting steel and alloys, including chrome/nickel steel for heat- and rust-resisting applications, and the production of all kinds of thin-walled pipes and connections; cast-iron piston-ring pots and single rings, cylinder liners, flanges, and coupling discs; copper alloys for bearing bushes, gearing blanks, and coupling components. In this extending field, German practice in particular presents certain points of interest.

According to the form and dimensions of the pieces to be cast, a centrifugal casting machine may have either a horizontal or a vertical axis of rotation, the former being used for castings with a length several times the diameter, while the latter is used for those having a large diameter compared with the length or height. However, the principle and general development of the process can conveniently be followed by referring to Figs. 1 and 2 which show the general lay-out of a plant of the horizontal-axis type produced by the firm of Ardeltwerke G.m.b.H., of Wilhelmshaven, for the production of cast-iron pipe, which embodies the latest German practice in this field. Bushes, pots, rings, and shaped castings, whether in cast iron or non-ferrous metals, naturally only require a much simpler installation (Fig. 3).

Pipe Installation

It will be seen from Figs. 1 and 2 that the main items of a pipe installation are five, comprising the casting machine, A, which consists of a foundation plate on which are mounted the bearings carrying four rollers which serve to support and rotate the mould. Between the bearings is a hydraulic cylinder for the insertion and extraction of the mould, and two hinged steady arms are provided to maintain it on its supporting rollers when rotating. The pouring equipment, B, consists of a trolley running

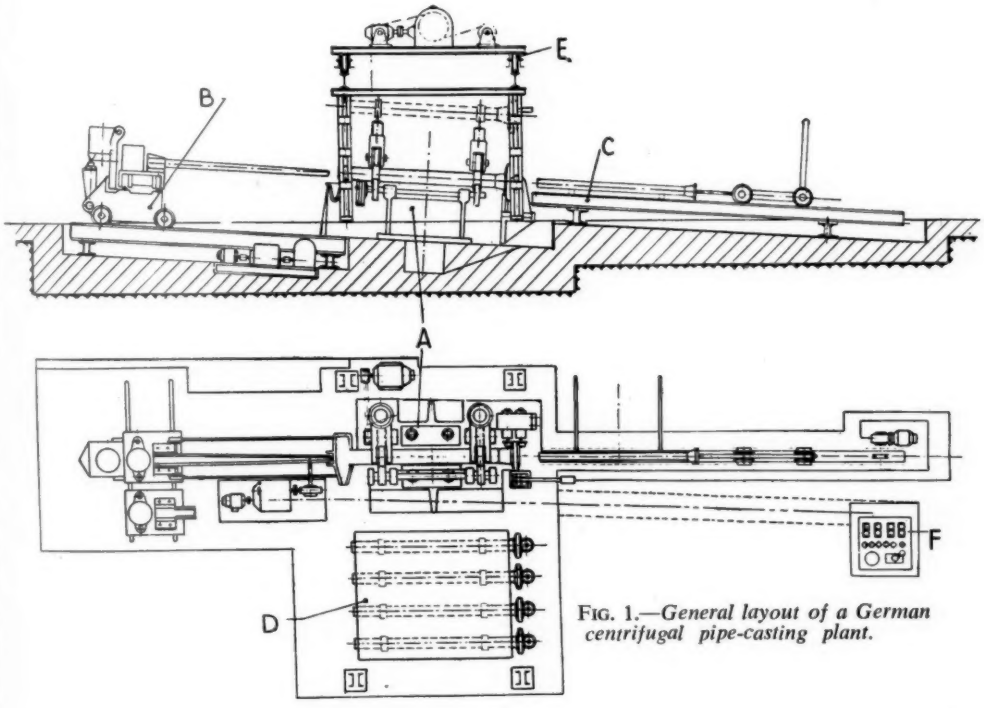


FIG. 1.—*General layout of a German centrifugal pipe-casting plant.*

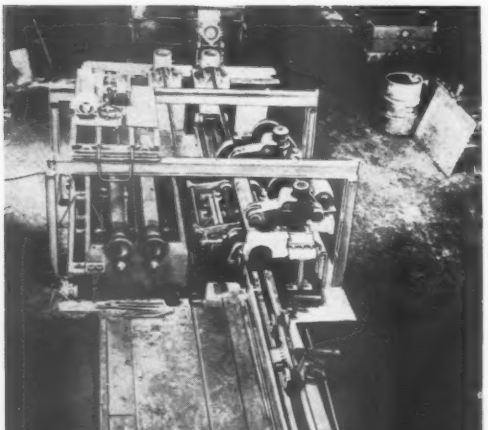


FIG. 2.—*Ardeltwerke complete centrifugal casting plant.*

on rails, with a receiving ladle and a pouring ladle with extended spout. The drawbench, C, for withdrawing the cast pipe from the mould, has an electrically-operated carriage with gripping tongs, with a discharge chute alongside. The mould magazine, D, is a steel frame having a capacity of four moulds, and is equipped both with gas burners for preheating the moulds, at the commencement of the shift, and air-blast equipment for cooling down. Rotation of the moulds in the magazine is effected by separately-mounted electric motor through reduction gearing. An overhead transport crane, E, serves for mould-changing, this crane comprising an electrically-driven carriage on a steel framework mounted on four columns.

Operation

Operation of the plant is as follows: Metal is first run into the receiving ladle of the pouring trolley, and this trolley (which runs on a sloping rail track) is advanced until the long pouring spout reaches the further end of the heated mould contained in the casting machine, which is already in rotation. As soon as the spout reaches the rear end of the mould, the receiving ladle is slowly and automatically tilted and the metal flows through the spout into the rotating mould while the pouring trolley, B, commences at the same time to withdraw, and the metal thrown by centrifugal force against the inner wall of the mould progressively builds up the pipe during this withdrawal. As soon as the trolley is back in its original position, rotation of the poured mould is stopped and the solidified (but still red-hot) pipe is withdrawn on the drawbench, C. Due to a special lining on the moulds, the pipe does not require any subsequent annealing.

The installation described, with its ancillary equipment, is suitable for a certain degree of semi-automatic operation, and press-button control is effected from the panel, F, where the charge-hand takes his stand. The pouring temperature of the metal for the process is from 1,220 to 1,260 deg. C. according to the work, and the actual pouring operation takes about 6 sec. The manning required is three operators, a change-hand who controls the operation from the board, a second man supervising the clearing of the spout, and a third attending to the changing of the moulds, the lining, and the setting of the spigot cores. Production is between 30 and 40 pipes per hour.

Operating costs of such a plant consist mainly of wages; electrical energy, about 20 kw. per hour; towns' gas for the initial heating of the four moulds (about 700 cub. ft.); and moulds. This latter is the most important item. The moulds may be either of cast iron with a life of some 1,000 castings, or of steel with a life of 1,500 to 2,000—or even more. The German cost of finished cast-iron moulds for pipes 4 in. dia. by 6 ft. 6 in. long is about £85 each.

FIG. 3.—*A vertical-axis centrifugal casting machine of the type used for bushes, flanges and rings.*

Centrifugal Casting on the Continent

The great advantage claimed for all centrifugal castings is the improvement in metal structure resulting from the process. Piston-ring pots or single rings cast by the process show a specially fine pearlite/graphite structure which is extremely difficult to obtain with normal sand castings. In the case of bronze bearing-bushes, the improved crystalline structure gives correspondingly improved running properties; and with thick-walled rings and flanges in steel, especially chrome/nickel alloy, segregation and piping is obviated, and there are no lost heads or risers as with sand castings. Generally speaking, it is claimed that for the same type of job and the same material, casting by centrifugal means results in an increase in tensile strength of between 20 and 50 per cent.

New Apprentice Scheme

Wednesbury and Darlaston Manufacturers' Association has pioneered an interesting educational and training scheme, designed to ensure that all youths beginning a career in industry in the area are given an equal chance of receiving expert training. Up to date, over 700 youths have embarked on the new apprenticeship course, specializing in any of a variety of 24 trades. The scheme is controlled by the apprentices supervisors' committee of the Association, and all 80 members of the Association are co-operating. Hitherto, expert instructors and modern training facilities have been provided only by the large firms, while smaller ones have been able to do but little owing to restricted finances and limited facilities. Under the scheme, if a youth—be he metallurgist, moulder, coremaker, or draughtsman—discovers that his employee is unable to offer him adequate training in the specialist aspect of his job, periodically he can visit a neighbouring firm which has the necessary tutors and equipment. In consequence the prospect of obtaining apprenticeship certificates as skilled and qualified craftsmen is greatly increased. All youths in the scheme are granted time (with pay) for further education at technical colleges and visits to exhibitions and inter-works visits are arranged. The president of the Association, Mr. L. Prichard, managing director of Springs & Pressings (Darlaston), believes that the scheme gives opportunity to every youth to enter the trade of his choice on a level footing, and the smaller firms gain considerably in this training of technical and craft skill. Two hundred youths had previously been presented with special apprenticeship certificates awarded under the scheme and Mr. J. H. Parker Oxspring, Director of Education for Staffordshire, presented more certificates at a ceremony in Darlaston Town Hall on March 18.

Bronze and Brass Ingot Manufacturers' Association

Speaking at the general meeting in Birmingham on March 16 of the British Bronze and Brass Ingot Manufacturers' Association, Mr. G. W. Booth, president of the Association, said that a surplus of ingot making capacity throughout the country has led to most unfortunate price cutting. It was hoped that when the Metal Exchange reopened, a world price would be established. However, it might be thought better for producers to market their own metal until times when the pound sterling was really convertible. A free market such as was known before the war could not function without free sterling. Mr. G. T. Whitehouse was elected president of the Association for the forthcoming year.

Scrap Price Allegations

Eleven summonses alleging the purchase of scrap metal at more than the controlled price were brought against a Bilston foundry firm at the Bilston Stipendiary Court on March 23. The summonses alleged that a total of 389 tons 13½ cwt. of cast-iron scrap was bought between January 31 and April 22, 1953, at an excessive price.

Prosecuting for the Ministry of Supply, Mr. T. E. Dale said that the price of scrap was regulated by counties, because the Ministry wished to discourage movement of scrap from one county to another and so avoid a shortage in any one area. The scrap was bought by defendants from a Lancashire firm and, although it was invoiced at the controlled price, further invoices were sent to the defendants, the effect being to increase the price. The scrap detailed in the extra invoices was fictitious because it was never delivered, and the system was adopted to evade price control by paying carriage. Mr. Dale explained that the maximum price included free delivery to the customer's premises, and it was quite unlawful to charge carriage to the customer.

On October 27, investigating officers of the Ministry saw the secretary and director of the foundry firm, who said that at the beginning of the year they were unable to get all the scrap iron needed. They got in touch with Rollinson's and, in view of the carriage from Lancashire to the Midlands, it was arranged that extra invoices should be sent to cover carriage.

Firm told the Ministry

On the same day, the firm wrote a letter to the Ministry saying that while they had not exceeded the amount licensed, they had paid more than the controlled price. They had found it impossible to buy scrap at the controlled price, and the alternative was to close the foundry or accede to the excess demands of merchants. The letter continued: "As a result of the publicity given to this matter over the last month or so, we have found scrap merchants more amenable and we have been able to buy at controlled prices." Mr. Dale added that there was no attempt by defendants to hide anything and the books were readily produced.

Ronald Charles Kemp, executive officer of the Ministry, stated that the company paid £3,864 13s. 4d. for the scrap concerned in the summonses, and the maximum permitted price was £3,001 16s. 2d., the excess being £862 17s. 2d. Replying to Mr. J. Varley, defending, Kemp said the firm were now authorized to buy scrap at more than the maximum price.

The defendants were committed to Staffordshire Quarter Sessions for trial. Mr. Varley intimated that they would plead guilty and would not call any evidence at the present stage.

International Foundry Congress (1955)

The Council of the Institute of British Foundrymen is now prepared to receive offers of papers for presentation at the 1955 International Foundry Congress to be held in London. Authors who wish to make such offers are asked to communicate immediately with the secretary of the Institute, who will forward them a copy of the Institute's publication "Notes for the Guidance of Authors of Papers." It is desirable that all formal offers of papers should be sent not later than June 1, so that they can be considered by the meeting of the appropriate committee which will be held later that month.

Notes from the Branches

Scottish—Annual General Meeting

The annual meeting of the Scottish branch of the Institute of British Foundrymen was held at the Royal Technical College, Glasgow, on March 13. Mr. John Cameron, Jun., O.B.E., presided, and was supported by Mr. E. Longden, national president, and Mr. T. Makemson, M.B.E., secretary of the Institute.

After the minutes of the previous A.G.M. had been adopted, Mr. John Bell gave his secretarial report. He recalled that the branch was formed 44 years ago, mainly from students in Mr. Campion's metallurgical class of the Royal Technical College. The membership this year at 498 was six fewer than 1953 but two higher than in 1952. Among prominent personalities who passed away during the year was Mr. H. L. Mortimer, who had been branch president in 1941-42.

A joint meeting was again held with the Dundee Institute of Engineers, when Mr. John Cameron, Jun., gave an interesting address. The Scottish North-Eastern section, under the presidency of Mr. Connacher and with Mr. R. Leeks as secretary, had continued to make progress; the Falkirk section, under the chairmanship of Mr. J. Ferguson, ably assisted by Mr. A. Bullock, the secretary, had had good meetings. Mr. J. M. Douglas and Mr. Walter Richardson had been awarded the Institute's diploma for a joint paper on the "Practical Application of Modern Aids in the Brass Foundry," the presentation being made by Mr. John Cameron, Sen.

The "Sir Archibald McInnes Shaw" prizes were won by Mr. Archibald Jackson (foundry practice) and Mr. James Hepburn (patternmaking). After expressing the congratulations of the members to Mr. John Cameron, Jun., on being awarded the O.B.E. for his work as an officer in the Territorial Army, Mr. Bell, who is resigning the position as honorary secretary held since 1923 expressed his thanks for the help given by so many people over a long period and said "good-bye." Next session, Mr. Bell, presuming events take their normal course, is to serve members as president of the Institute.

Election of Officers

At the meeting, the following were elected as office bearers for the 1954-55 session :—*As president,* Mr. D. Brown; as *senior vice-president,* Mr. J. M. Douglas; as *junior vice-president,* Mr. H. J. M. Connacher; as *members of Council,* Mr. John MacGregor; Mr. T. R. Miller; Mr. W. Paton; and Mr. J. Ferguson; as *representatives to General Council,* Mr. J. Cameron, O.B.E.; Mr. J. Cormack; and Mr. R. R. Taylor; as *representative to Technical Council,* Mr. James McPheat; and as *hon. secretary,* Mr. Alexander Marshall.

Bristol and West of England

The meeting on February 20 of the Bristol and West of England branch heard a Paper "Steelfoundry Process Control." presented by Mr. S. L. Finch. The Author dealt fully with many aspects of production in a typical steel foundry, and illustrated his talk by means of many interesting slides. The members present were shown how, by means of such items as careful adherence to a budget and investigations of any undue deviation from the estimate, a foundry can assess the efficiency of its productive capacity, and where necessary make improvements. Mr. Finch indicated the value to the foundry of the recent development of non-destructive testing methods and stated that when correctly applied, the results of such tests are of great help to all engaged in the industry.

Referring to "aids" in the foundry, it was stated that much improvement in output can be obtained by the use of impeller-type ramming machines for loose-pattern work. It was essential, however, that a good sand plant was available. When considering the physical properties of steels, Mr. Finch pointed out that great care was necessary when cutting off the "heads" of alloy castings, in order to avoid surface cracking; a square runner was always easier to knock off than a round one. It was considered that a square-type Washburn core was better for assisting feeding than a series of small round holes, which were liable to cause reduced fluidity.

In proposing a vote of thanks, Mr. I. J. Birch said that the lecture had been very comprehensive in its treatment of the subject and that efficiency of methods, both statistical and practical, was the keynote of the Paper. The vote of thanks was seconded by Mr. E. Jeffries.

Hot-blast Cupola Practice

Mr. Bertil Thyberg has summarized a paper which he presented to the Swedish foundry owners' association (technical section) in the following terms:—

A review is given of the history and the theory of the hot-blast cupola. Different principles of preheating the blast are described. Cupola designs in which the heat content of the gases is used for heating the blast are treated in detail, and special attention is given the hot-blast cupola at Husqvarna Vapenfabriks AB, which has been used since February, 1952. Coke consumption, loss of silicon and manganese and sulphur pick-up have been reduced while melting rate and carbon pick-up have been increased. It is possible to use more steel scrap in the charge. Among the drawbacks the high capital costs and the need for more supervision may be stated. The advantages are, however, much greater than the disadvantages.

The paper, which is printed in the February issue of *Gjuteriet,* carries the following interesting Table:—

Table I.—Heat Balance with a Cold- and Hot-blast 5-tons per hour Cupola.

	Cold Blast.	Hot Blast.
	per cent.	per cent.
Heat input—		
Coke	96.3	83.3
Combustion of Si and Mn.	3.0	3.5
From the blast	0.7	13.2
Total	100.0	100.0
Heat output—		
Liquid iron	30.0	43.0
Exit gases*	57.0	40.0
Liquid slag	4.0	3.0
Diverse losses	9.0	14.0
Total	100.0	100.0
* Of the exit gases—		
Latent heat (combustible)	39.0	27.0
Sensible heat	18.0	13.0

AT THE MECHANICAL HANDLING EXHIBITION, Olympia, June 9 to 19, Ransomes Sims & Jefferies, Limited, of Ipswich, will show an electric runabout crane (capacity of 25 cwt.); a battery-operated forklift truck (2 tons); a model FL.20 truck (1 ton); an elevating platform truck, several tractors, and a crane truck.

Production of Vitreous-enamelled Iron Castings*

Discussion of Mr. A. Adam's Paper

The Author's Paper had touched on so many issues and variables fundamental to the art and science of both founders and enamelling, that to many of his audience it was an astonishing revelation that concrete progress had been made. Thus questions, tardy in coming, concerned detail rather than basic information. In this fashion, ways of removing the potentially harmful casting skin came in for major comment, along with comparisons between vitreous enamelling in this country and abroad. Founders were quick to appreciate the value of non-turbulent running, but hardly expected to learn that the last casting in a box to be poured could produce defects in enamelling, just because it was *last. Experiments towards co-operative research on identical castings scattered for enamelling between plants in different parts of the country had apparently been largely nullified by factors outside individual control. As usual, design problems were touched upon, but here the Author was perhaps more far-seeing than most, when he pleaded for fewer restrictions to be placed on the designer—in case that individual might decide cast iron was not the "right" material, anyway! Undoubtedly arising from this discussion is the fact that it is the British insistence on superlative appearance and durability that is a cardinal factor in cast-iron enamelling techniques in this country.*

At the January meeting of the London branch of the Institute of British Foundrymen MR. F. HUDSON, F.I.M. (junior vice-president) occupied the Chair and before calling upon Mr. A. Adam (of R. & A. Main, Limited) to present his Paper on the "Production of Vitreous-enamelled Iron Castings," extended a warm welcome to members of the Institute of Vitreous Enamellers who were present. Introducing Mr. Adam, the chairman said that over many years he had devoted a very great deal of time and attention to the whole subject of vitreous enamelling; so that the meeting could be assured that his Paper would be both instructive and interesting.

(Mr. Adam then presented his Paper.)

Skin Effects

Subsequently, the Chairman, opening the discussion, said it was many years since he had been connected with the iron founding industry but during the presentation of the Paper he had recalled an occasion when he had had to report on a casting weighing about 3 tons, for use in the marine-engineering field which had been left in the foundry yard for a few weeks. At that time, in many of the large marine engineering shops it was very common for the fettlers to make all kinds of peculiar marks on the castings by means of a grinder, indeed, he believed that in some shops the practice was still customary. The blue skin of the castings was more resistant to rust, but where that skin had been removed the castings rusted. At the time of which he was speaking, a very careful examination was made of the surface condition of iron castings, and it was found that the blue skin was associated with a decarburized layer. In other words, on the surface of a casting there was a decarburized skin of minute thickness. That experience now led him to wonder whether or not such a decarburized skin played some part in the occurrence of blisters on castings which were subsequently vitreous enamelled. He suggested, therefore, that if Mr. Adam could investigate the effect of the varying composition of the surface from the rest of a casting he might get nearer to the solution of the problem of blistering.

MR. DAVIS expressed some disappointment because he had not had the opportunity to learn from the Paper how castings were actually enamelled, as he had hoped to do. He had understood generally that on a perfect casting one would apply some cheap enamel, but on a poor casting one would apply an expensive enamel!

Enamelling Process Surveyed

MR. ADAM said he was afraid he had assumed that the general technique of vitreous enamelling was understood, although very few people would claim to understand just what occurred in the vitreous enamelling of a casting. In the general technique of "wet"-process enamelling, after passing the casting through various dressing and cleaning operations and the necessary drilling and machining to enable it to serve the purpose for which it was designed it was usually annealed (in the same type of furnace as that in which it was subsequently enamelled at a temperature possibly between 750 and 830 deg. C. for (say) half an hour. After this, it was shot-blasted. Enamel in the form of a finely-ground suspension in water was then applied by spraying or dipping to the surface, clay or alginates or other substances being used as suspension media. The coating on the casting dried at a relatively low temperature in a steam- or gas-heated oven or any type of low-temperature drying apparatus. The covered casting or castings were then placed in a muffle furnace, which might be of the box pattern which dealt with one batch at a time, or a continuous furnace. The treatment applied there consisted, in general, of raising the castings, with their covering of dried enamel frit, to a temperature of 700 to 850 deg. C.

* Paper printed in the JOURNAL, March 4, 1954.

During that heat-treatment the bisque fused. On removing the castings from the muffle, one had, if nothing untoward happened, a batch of castings with a nice, smooth vitreous-enamelled coating.

MR. A. R. PARKES asked whether the excellent results which some Continental makers achieved in their enamelled ware might be due to the buffing of the surfaces, thereby removing the skin which otherwise seemed to cause trouble.

MR. ADAM said that in his view that was undoubtedly the case. The castings he had examined on the Continent were usually covered with an extremely soft enamel; that applied in America also. American stove castings were usually finished on one side only with a very soft black enamel, which fused at quite a low temperature. The practice of buffing, which was very prevalent both in America and on the Continent, undoubtedly helped to give those nice smooth surfaces.

Effect of Pouring Conditions

MR. MURRAY drew attention to pinholing in a sample which was submitted to the meeting for inspection, and he asked what form of runner system was used. He also asked whether there were two castings in a mould and, if so, whether one had proved to be more gassy than the other. Were slag traps used in the runner system?

MR. ADAM replied that in his foundry they did not in general use slag traps, but rather tried to avoid them. He invited his colleague, Mr. Holland, who had produced the casting referred to by Mr. Murray, to explain how the pinholes arose and what he did to avoid their occurrence in general practice.

MR. E. HOLLAND said the chief way in which to avoid gas holes was to avoid turbulent pouring. When three quarters, or so, of the contents of a ladle of metal had been used, the pouring having been stopped and started again as each casting was run, sometimes there was gas in the metal. On one occasion a system had been tried whereby the castings were run from the very end and the metal trickled down-hill and all over the mould surface, and there was then excessive gas-holing. The castings shown were now run from the side and pinholing had virtually stopped. This runner had a form of slag trap, a bottom runner bar and a top runner of about $\frac{5}{8}$ in., half round.

On another occasion, his firm had tried running three castings in each moulding box. Six moulders were engaged in pouring the castings, and all of a particular batch of castings were examined. It was found that those made by one man consistently contained more gas-holes than the rest. His method was to pour two of the castings in each mould all the way down his line of boxes, and then to pour the odd casting in each mould from the next ladle. Every one of the single-poured castings had gas-holes in some degree. If possible, it was far better to pour all the moulds in a box through one downgate.

Cleaning Methods

MR. B. B. KENT asked if the Author had experimented with different methods of cleaning castings. Had he tried blasting with synthetic abrasives or with sand? He believed the reason why it was said that castings produced on the Continent enamelled better than those produced in this country was largely because Continental founders were allowed to use sand for blasting. If it were permissible here to blast castings with sand British makers would get a very much improved finish.

MR. ADAM replied that his Company had experimented with various grades of shot, they had added sand to the shot, and so on. For example, they had blasted some castings with shot in a hand cabinet, and then had blasted similar castings with shot to which was added a particular type of sand which had been recommended by a neighbouring foundry, and had compared results. The castings which had been cleaned with the mixture of shot and sand had given better enamelling results than had those cleaned with shot only. However, when a batch of similar castings was cleaned in the air-less blasting machine, with chilled-iron shot only, those castings had given far better enamelling results than had either of the other two batches. The reason seemed to be that a good deal more energy was imparted to the shot in the air-less machine, than in the hand cabinet, and the important factor was not the type of abrasive used, but the actual amount of material which was taken off the surface of the castings. In small-scale experiments, it did not seem to matter how the castings were cleaned so long as sufficient material was removed from their surface. It was possible to buff the surfaces and never touch them with shot or sand, and they would enamel perfectly.

Co-operative Efforts

MR. PARKES asked what other people were doing in regard to the preparation of castings for enamelling and what other researches were going forward in the industry.

MR. ADAM said the British Cast Iron Research Association had an active interest in a programme of work of that nature. He believed that when the evidence they had gathered was analysed properly it would be found to confirm to some extent the views he had expressed. His foundry had participated in a co-operative effort organized by the B.C.I.R.A., in which four foundries had produced flat castings which were subsequently enamelled in three different enamelling shops. One of his firm's foundries and one of their enamelling shops took part. One enamelling shop was able to enamel successfully all the castings produced by all four foundries. Another shop had obtained relatively poor results with all the castings. A possible explanation was, he believed, that the enamelling shop which had consistently obtained good results employed an electrically heated muffle furnace, which meant that there was no leakage of products of combustion into the muffle during "firing." That firm also used very fluid enamel, possibly one which contained very little clay likely to evolve water-vapour. That shop was also situated in the north

of England, and he suggested that if the enamelling had been done when the outside air temperature was low and when there was low water concentration in the atmosphere, that fact alone could explain the difference between the results obtained in that particular shop and, for example, in his own Company's shop, which had not shown up particularly well. In his shop, the castings were enamelled in either gas- or oil-fired furnaces, in some of which the products of combustion leaked into the muffles, and it was possible to trace a correlation between the leakage of the products of combustion and the degree of blistering that occurred.

MR. G. C. PIERCE (branch past-president) recalling an occasion, some ten months ago, when he had taken part in a discussion on the enamelling of castings, said that some most horrible examples of castings were produced there purposely in order to show what it was alleged the foundries were doing for the enamelling industry; he was glad Mr. Adam had produced some castings which were distinctly superior. On the former occasion, Mr. Pierce had concluded that, just as the foundrymen had something to do with the problems affecting the enamelling process, so had the enamellers something to do with those problems, and his plea then was that the enamellers should play their part and find an enamel which would not blister or swell, while the foundrymen were endeavouring to find out what was wrong with some of the castings. He felt there was much to be said with regard to the methods of running the castings, and that turbulence was a very important question.

Drastic Treatment

It was pleasing, Mr. Pierce added, to learn that enamelling results varied in much the same way as did those of the foundries. Having had some little experience in making a variety of castings for enamelling, he could remember an occasion when castings were taken away from one enamelling shop and sent to another, and totally different results were obtained, although the castings were the same. It had seemed to him then that it was not so much a question of what the foundrymen turned out as of what the enamellers did to the castings. That remark applied more particularly to the cracking of castings. It had been his task to investigate the reasons why the castings had cracked during the enamelling process. They were of very thin section and fairly large, covering an area of at least 2 sq. ft. about 18 in. high. When he had seen the cold castings disappear rapidly into an oven at a temperature of about 800 deg. C. he really could not understand how any casting could be expected to withstand such treatment and was not all surprised that the percentage of cracked castings was high. He had attributed it entirely to the way in which the castings were treated. If enamellers subjected castings about ¼-in. thick to such treatment they must expect some of them to be cracked. After all, some castings even cracked when cooling in the mould, until the foundrymen found out the correct way in which to make them, but it did not mean that all the stresses were relieved; some cooling stresses were still there, and if enamellers put castings of that description into an oven at 800 deg. C. they must expect some cracking to occur.

Again, designers could help very considerably by careful design of the castings. He had had occasion to request modification of design of castings because of the disastrous results obtained not only in casting, but in enamelling, particularly due to the placing of bosses on thin-walled sections.

MR. ADAM said he quite agreed with Mr. Pierce. Nevertheless, it was desirable as far as possible to avoid restricting the designer by telling him, for example, that he could not put a boss on a thin section, because one of the intrinsic advantages of castings as compared with pressings was that one could make castings of practically any shape, and it did not appear that castings made for enamelling should be so vastly different from ordinary castings.

MR. A. R. WIZARD asked if Mr. Adam had tried dipping the castings in acid in order to take off the 0.002 in.-thick skin, which seemed to cause most of the trouble and could this be done before shot-blasting. If he adopted this method, could he safely get rid of the acid after the skin had been dissolved away?

MR. ADAM replied that he had not tried that method on a works scale, but he had tried pickling castings in the laboratory before enamelling; he did not think any improvement had been effected. Also, he considered it undesirable for a material like cast iron, which, though it may not be porous, had a fairly open structure at times, should be given such a surface treatment before enamelling. The method could be investigated, however, A suggestion that the castings could be treated with a fused salt, such as borax, had been put forward, and he believed that some advantage could be gained from treatment of that sort. Fused nitrates might also be tried but, personally, he had no experience of such processes.

Customers' Viewpoint

MR. RIGG (North Thames Gas Board) said that although he felt very much an intruder because his industry did not make castings or enamel them, he would like to speak as a representative of the gas industry which purchased very large quantities of goods which incorporated enamelled castings. He supported all that Mr. Adam had said about the quality of the castings and the difficulties of putting the enamel on to them. Speaking on behalf of the gas industry's many consumers, he said that a great deal of trouble was experienced at times due to the chipping of the enamel; and usually the enamel was found to be far too thick. The impression gained was, rightly or wrongly, that the operators who applied the enamel to the surface were possibly aware of the difficulty of enamelling castings as explained by Mr. Adam and of the imperfections in them, and in order to ensure good coverage of the castings they applied too much enamel. The result was that at a later date the enamel chipped in use, and the Gas Board, on receiving complaints, was faced with the cost of an exchanged part and of communicating with the enamellers to diagnose and remedy the cause.

Mr. Rigg added his thanks to those of the other

members present for all that Mr. Adam had shown that evening about castings and the difficulties of enamelling them.

MR. ADAM replied that when a casting appeared to have a rather thick enamel coating it did not mean usually that the enameller was generous and had applied a thick coating, but that the first enamelling had been rejected for one fault or another and he had put another coating on top.

MR. B. B. KENT pointed out that much depended on the enamel that was applied. He could apply really poor enamel to a very good casting, and a drop of water would mark it. On the other hand, he could use good acid-resisting materials.

A MEMBER said that most enamels were nowadays made all to a specification calling for full acid-resistance. He knew that a very soft, low-temperature enamel could be applied to almost any kind of casting and would not show blistering, but he agreed with the previous speaker that a drop of rainwater could mark such a material.

Design

MR. F. L. FEASEY expressed surprise to hear it mooted that castings should be made embodying unequal thicknesses, as the experience of vitreous enamellers generally had been that with varying thicknesses of metal trouble was experienced. It was the recommendation of the Vitreous Enamellers' Association that in designing castings every care should be taken to ensure equal thickness of metal. The suggestion of the speaker, that a castings be designed with a thick boss here and a large lump there, with a thin section joining the two together, and then to endeavour to enamel such a casting was a little fantastic.

MR. ADAM agreed that designers had been asked to keep their sections uniform and as thin as was reasonably possible. Fifty years ago, when the vitreous enamelling of cast iron was really becoming an industry, the enamellers had found that it did not matter what the section was because they could enamel it perfectly satisfactorily. To keep the section thickness constant was not the whole answer; it should be kept thin at the same time. Those who had designed components for vitreous enamelling had been brought up to believe that the section should be kept as thin as possible and that there should not be bosses and lumps all over it. However, such a stipulation meant restricting designers, and there were frequently cases where, if a boss could be put on, a very awkward problem could be solved, whereas without it the problem remained and the finished job would not look so good.

One of the requirements of the domestic-appliance buyer was that screw heads should not be visible on the outside of the appliances, and he felt that that was a justifiable viewpoint. When one looked at a gas cooker which had no screws visible on the outside and compared it with a cooker made 20 years ago, and which showed screws " by the dozen," there was no questioning which was the more attractive. Enamellers did not want to tie down the designers to the point at which they could not take any liberties at all with the process. If a process could be devised which would enable castings having bosses, etc., to be enamelled without difficulty, then in his view enamellers should adopt it.

Dry- and Green-sand Moulding

MR. A. TALBOT said he had had to produce a series of six gearboxes, each weighing about 18 cwts., and there was not an even cross-section anywhere, but they had been vitreous enamelled. Five had enamelled perfectly, but the other one was defective. The only reason he could give for that difference was that the castings had to be produced quickly, and in the case of the last one only the bottom part of the mould was made in dry-sand, the top being made in green-sand, and there was a little trouble in making that top. He asked Mr. Adam if there were normally a difference in the enamelling as between dry-sand and green-sand moulded castings.

MR. ADAM replied that undoubtedly the difference that Mr. Talbot had experienced was due to the fact that five of the castings were made in dry-sand moulds and one in a green-sand part mould. In the light iron castings industry, in the ordinary way all castings were made in green-sand moulds and therefore the question of drying the sand did not arise; after all, dry-sand moulds were expensive as compared with those of green-sand, and when thousands of cookers were being produced per week the amount of labour, and so on, that would be involved in drying the moulds was considerable. For that reason, such a solution to the problem was not feasible.

British Quality Supreme

MR. WIZARD, recalling the point that American plants used mainly soft enamels and only buffed the surfaces of the castings, and yet were very successful, asked why we in this country did not use more soft enamels in this country. Was it because such enamels had not a sufficiently long life or were not attractive enough in colour?

MR. ADAM said the answer was that the enamels applied to castings in America and in France and Germany were thought to be too soft to withstand ordinary domestic conditions. It might well be that the housewife in this country was too critical, although he was not prepared to say that she was. If the founder made a gas or an electric cooker and put on it an enamel, which he knew would have its surface damaged irretrievably by the first spot of fruit juice which fell on it, he was selling under false pretences. An enamel must be applied so as to give a long-lasting trouble-free finish. In America, because of the trouble experienced in enamelling cast iron, practically no cast iron was enamelled. About two years ago, he had visited a large number of plants there, and the process of replacing castings by sheet iron had gone so far that even the tops of the big American ranges were made out of pressings spot welded together and covered with an acid-resisting enamel, mainly because the American firms could not apply an acid-resisting enamel to the castings which were being produced. In

plants where enamelling cast iron was being done, there were complete shops full of men engaged on buffing the castings; labour was expensive there and the manufacturers were spending about 2 dollars or more per hour per man on buffing castings. The cost of that operation was surely far greater than the cost of adopting either some modified foundry technique, such as shell moulding, or some modified enamelling technique such as just blowing dry air into the muffle. Out of about 20 plants examined only one still had a foundry; other American enamellers using castings bought them from a jobbing foundry and knew nothing whatsoever about the quality of the material, and to those castings was applied the softest black enamel that could be obtained. He had never seen a casting enamelled there in anything but a black enamel, nor had he seen a casting larger than an ordinary vitreous enamelled ashtray.

MR. G. A. VASEY said the Americans, Zappfe and Sims, took great care in the drying of their mould surfaces, and they achieved very much better enamelling results with the castings produced from the dry moulds. They had explained that phenomenon in terms of hydrogen pick-up by the metal in the mould when the sand was not dried, which hydrogen was subsequently evolved in the enamelling operation. His company did not believe that hydrogen was the main cause of blistering in enamelling, for analysis of the gases coming from an enamelled casting during the enamelling operation showed that there were considerable quantities of carbon monoxide and carbon dioxide evolved.

Vote of Thanks

MR. B. B. KENT, a member of both the I.B.F. and the I.V.E., proposed a vote of thanks to Mr. Adam for having presented the paper. He had been intensely interested in it and also to hear of the amount of research which was going on in connection with the production of good castings.

Conditions had changed, particularly over the last 20 years. Enamellers were experiencing probably as much trouble now as previously in the enamelling of cast iron, but perhaps for different reasons. In 1931 he began enamelling gas cookers with sharp edges on them and the sections were very thin; the results were indifferent. Since then the composition of enamel had changed; everyone now asked for much better enamel, and most of the old faults in the making of the castings had vanished. Normally, enamellers obtained well-designed castings nowadays, but often they were carelessly made. Recently, his company had made a complaint to a foundry firm, asking them not for analyses, extra tests, and so on, but just to be more careful, and on the following day the castings delivered had been much better than those received formerly.

MR. A. TALBOT, seconding, said that he had come to the meeting with the feeling that the subject was rather outside his ambit, but Mr. Adam had kept him fully interested right from the start and he had learned much of value about vitreous enamelling. Also, as a result he would try to steer clear of some of the troubles that had been mentioned. He thanked Mr. Adam most sincerely for a very interesting paper.

(The vote of thanks was heartily accorded.)

MR. ADAM, responding, said he had enjoyed putting the Paper together, a task which had to some extent clarified his own views. When one was always considering a problem of that sort there came a time when one could not "see the wood for the trees"; so that the preparation of the Paper had been of personal advantage also. If he had interested the members and possibly had helped some founders and enamellers to deal with their joint problems, he was very glad to have been able to do so.

Producing Metallurgical Coke

Carbonization of Blends of Coal

The hard coke required for metallurgical purposes has always been made either from type 301 coking coal, which occurs only in Durham and South Wales, or from gas-coking or gas coals (types 400, 500, or 600). Type 301 coal gives the best quality coke, but although the cokes produced from the other coals, particularly types 500 and 600, are not of such high quality, they are still acceptable for blast-furnace use. With the growth of the steel industry, demands for metallurgical coke are increasing and supplies of suitable coal are inadequate. In particular, the reserves of the best coking coal are low, amounting to only 6 per cent. of the total coal reserves of the country, the best seams are approaching exhaustion, and mining costs are relatively high.

For several years, the Fuel Research Station of the Department of Scientific and Industrial Research has been investigating the possibility of eking out these valuable coals and producing hard coke by carbonizing blends with other more plentiful coals. At a meeting of the Institute of Fuel last month, Mr. H. Bardgett described the success that has already been achieved and gave details of the results. Carbonization was effected in a setting of two Woodall-Duckham intermittent vertical chambers, each holding a charge of 2¼ tons, after experiments in collaboration with the National Coal Board had confirmed that the cokes produced from coking and gas coals in these chambers were similar in physical properties to cokes made from the same coals in commercial coke ovens.

It was found that a weakly-caking high-volatile Northumberland coal, type 801/802, could be blended with Durham coals, types 301, 401, and 501, to the extent of 50, 30 to 40, and 40 per cent. respectively to produce coke of 2/1½ in. shatter indices of 80/90 and of Cochrane abrasion index not below 74. Data are given to show that although the coke from a Durham gas coal, type 501, is acceptable for blast furnaces, its quality can be improved by even small additions of Durham coals of types 301 and 401. A Durham "cinder" coal, affected by igneous intrusion, can be used to the extent of 20 to 25 per cent. in blends with a Durham coal, type 401, without effect on the strength of the coke and with some increase of size. All the cokes made from the blends of coals mentioned in this summary, as judged by their physical properties, should be suitable for use in blast furnaces.

R. J. RICHARDSON & SONS, LIMITED, Commercial Street, Birmingham, 1, have sent to their customers a motor-map covering the roads and hostelries between Birmingham and Cornwall.

Publications Received

Customer/Founder Convention. Published by The British Steel Founders' Association, Broomgrove Lodge, Broomgrove Road, Sheffield, 10.

The convention referred to in the title of this very attractive publication took place in London last April. The five papers have been reproduced together with a verbatim report of the discussions. If the latter had been changed from the first to the third person, reading would have been easier. The brochure opens with "Recommendations to Steelfounders," and is immediately followed by "Recommendations to Customers." Wisely this has been reprinted as a special publication, for the issue of such a document was the *raison d'être* of the convention. Much of what has been written applies with equal force to the whole of the foundry industry.

The Immortality of Steel (The Story of the Steel Scrap Drive), by Capt. H. Leighton Davies, C.B.E. Published by the British Iron and Steel Federation, Steel House, Tothill Street, London, S.W.1.

This beautifully produced booklet is of the nature of a valediction, for now the great urge for scrap has receded and demand and supply are balanced. Yet it was wise to place on record the story of how 735,000 tons of scrap was recovered from obvious and obscure places. The publicity matter issued, which in retrospect still looks very attractive and compelling, is illustrated and reviewed. Some of the scenes recaptured are of historic interest, such as the firing of London's last tramway car. An interesting story has been recounted in fascinating manner, and moreover it is one from which the foundry industry benefited.

Selecting the Man for the Job. One of the "true story" series prepared by the Ministry of Labour and National Service and the Central Office of Information. Available on request from Director of Public Relations, M. of L. and N.S., 8, St. James's Square, London, S.W.1, or local offices of the Ministry.

This 28-page booklet has been produced with the object of avoiding "misfits" in industry and the theme that it may mean a loss to a firm of as much as £50 to £100 for each semi-skilled operator who is trained and then leaves. It takes the form of a verbatim report of a discussion on interviewing for personnel selection between a managing director of a family business, the personnel officer of a large firm, a foreman, and a psychologist who has specialized in selection methods. Long before one comes to the end of this rather tedious discussion it is clear that another of the objectives of the booklet is to praise the activities of the National Institute of Industrial Psychology. The last 1½ pages, wherein some conclusions are listed, are those to which busy executives might well turn first. Some of these, even, are so platitudinous as to be obvious or meaningless. However there are some quite good sketches to provide comic relief.

Elements of Foundry Costing—Part IV, Fettling and Routine Inspection, by H. P. Court and W. E. Harrison. Published by the Council of Ironfoundry Associations, 14, Pall Mall, London, S.W.1.

This section the reviewer rates more highly than the preceding two sections ("Metal and Melting" and "Moulding and Coremaking"), for there is a greater appreciation here of the needs of the smaller foundries, and realization that, particularly in costing, "what is one man's meat is another man's poison."

Following introductory remarks, where some of the diverse needs are quoted, there are dealt with in turn the analysis of wages, methods of recording fettling-shop output, inspection, overheads and estimating. The distinction between departmental "overheads" which can be related to direct labour charges and those best computed on a bulk weight basis is well drawn. Two most useful charts are reproduced to illustrate these points. It is stated in the opening remarks that a jobbing ironfounder will find it difficult to allocate fettling-shop costs with the same accuracy as in other departments, yet the reviewer feels that if commonsense be applied in the application of the principles enunciated there is no reason why a sufficient accuracy should not be attained.

Les Mines de Fer Françaises (French Iron Mines). Published by the Société des Hauts Fourneaux de Saulnes (Jean Ratz et Cie), 8, Place d'Iéna, Paris XVI.

It may not be generally realized that France, after the U.S.A., is the world's largest producer of iron ore and the biggest in Europe. A great effort has been made to bring French extraction to the imposing total of 42¼ million tons; at that figure it exceeds the U.S.S.R.

This beautifully-presented brochure contains maps, pictures, graphs, and tabular matter to illuminate a not only interesting but a profoundly important subject. Though iron ore is one stage removed from iron and steel foundry practice, yet its economic exploitation is a prime factor in the selling price of ferrous castings. The tables of statistics contained in Part II are world wide in their coverage. From one it is learnt that Spain in 1913 exported nearly nine million metric tons of iron ore, whilst that country last year only attained 1¾ m. The first part comprises about 100-pages and sets out in great detail every phase of iron-ore mining right down to the miners' housing estates. We congratulate Mr. Jean Ratz on having published such an essentially readable book on a much neglected subject.

Outline of Progress—Commemorating 75 Years' Industrial Service. Published (for limited circulation) by T. W. Ward Limited, Albion Works, Sheffield.

The reviewer was more than ordinarily interested in this record of outstanding progress in a wide field of industry. "Tales are told—few of which, unfortunately, are verifiable at first-hand to-day—of the trials and tribulations of those first few months of hard-won business." A story which is thought to be true is that T. W. Ward's father—a coal merchant—died insolvent, and the son as soon as possible, paid off these debts and thereby established himself as being thoroughly credit worthy. The book is well printed carrying excellent pictures and well-written letters. The comparison of the balance sheets of 1906 and 1953 gives in prosaic figures the progress made in a multiplicity of activities ranging from shipbreaking, through machine-tool reconditioning, structural steelwork, quarrying, constructional engineering to foundry supplies. Like so many other great firms, this concern now forms the T.W.W. Group of Engineering and Industrial Undertakings and *force majeure* this book does provide a useful directory of the structure and activities of the group. There are many other useful and interesting features about the book, which all recipents will unquestionably appreciate.

THE MINISTRY OF MATERIALS announces that as from April 23 the remaining duties of the Directorate of Non-Ferrous Metals at Rugby will be taken over by the headquarters of the Ministry of Materials, Horse Guards Avenue, London, S.W.1, and correspondence should be addressed accordingly. Mr. R. F. Rucker, the present director, will retire from the public service at the end of April.

Personal

MR. J. C. HOWARD, a director of Electric Furnace Company, Limited, has been made a director of E.F.C.O. Engineering Company, Limited.

MR. L. MARSHALL has been appointed commercial manager of the colliery equipment division of Head, Wrightson & Company, Limited, Thornaby-on-Tees.

MR. RALPH COX has been appointed Board of Trade and Ministry of Supply Controller for the southern region, in succession to MR. F. A. SWANN.

MR. ERNEST CLARK WHITE, vice-chairman of Crosthwaite Furnaces & Scriven Machine Tools, Limited, Leeds, is retiring after 56 years' association with the company.

MR. J. F. WILLIS has been appointed as the representative for Scotland of Hopkinsons, Limited, brass, bronze, iron and steel founders, of Huddersfield.

MR. ERIC GIBBONS, technical director of Gibbons (Dudley), Limited, gas and furnace engineers, is to be chairman of the Brierley Hill (Staffs) Urban District Council this year.

MR. GEORGE E. ROBINSON has been appointed sales manager of the foundry and engineering division of the Brightside Foundry & Engineering Company, Limited, Ecclesfield, near Sheffield.

DR. RICHARD BODY has been appointed medical officer of the Steel Company of Wales, Limited. He will pay particular attention to preventative medicine and reduction of the accident rate.

MR. P. A. BRIDGE has been appointed sales manager of the mechanical group, covering all types of hose, mouldings, roller coverings, and extrudings, of Dunlop's general rubber goods division, Manchester.

MR. W. E. HOARE, of the Tin Research Institute, has been granted the degree of Doctor of Science by London University for his published works on the reaction between iron and tin, particularly in tinplate.

MR. O. G. HALLIWELL has been appointed chairman of the Federation of Light Metal Smelters for the ensuing year in succession to Mr. F. Farenden. MR. O. METZGER has been appointed vice-chairman.

MR. SAM BLACK, MR. J. CHALMERS BROWN, and MR. SYDNEY HARRISON have been appointed members of the Scottish Committee of the Council of Industrial Design by the President of the Board of Trade.

MR. BILL HOLMES has been presented with a gift from the chairman of Edgar Allen & Company, Limited, steelmakers, engineers, etc., of Sheffield, on completing 50 years with the company as a crane driver.

MR. B. LEVY, of B. Levy & Company (Patterns), Limited, was last week elected vice-chairman of the founders and patternmakers' technical committee of the Engineering and Allied Employers' London Association.

MR. ARTHUR E. SKAN, a director of George Ellison, Limited, enginers, switchgear makers, etc., of Birmingham, and its associates, Tufnol, Limited, and Arthur Ellison, Limited, has been elected chairman of the British Plastics Federation.

DR. A. R. J. P. UBBELOHDE, F.R.S., Professor of chemistry at the Queen's University of Belfast, has been appointed to the Chair of Thermodynamics at the University of London, tenable at the Imperial College of Science and Technology.

PROF. E. S. HILLS, Professor of geology and mineralogy at the University of Melbourne, and SIR CHRISTOPHER HINTON, managing director of the industrial group of the Department of Atomic Energy, are among the 25 new Fellows of the Royal Society.

MR. J. RAMSAY GEBBIE, managing director of Wm. Doxford & Sons, Limited, engineers and shipbuilders, of Sunderland, has returned from a visit to the United States after preliminary talks, which, he is confident, will result in orders for the company.

MR. WILLIAM THOMAS OWEN, education and training officer at the Redbourne Works, Scunthorpe (Lincs), of Richard Thomas & Baldwins, Limited, is to take up an appointment with the Whitehead Iron & Steel Company, Limited, Newport (Mon). Mr. Owen went to Redbourne in 1952.

MR. A. C. DRUMMOND has been appointed general manager and secretary to the Lead Development Association. For the past seven years Mr. Drummond has been secretary of the Lead Industries Development Council, which has become the Lead Sheet and Pipe Council, an associate member of the Lead Development Association.

MR. A. D. MACKENZIE has succeeded Mr. T. Lee both as president of the National Ironfounding Employers' Federation and as a member of the executive of the Council of Ironfoundry Associations. He is chairman of the Scottish Ironfounders' Association and chairman and managing director of Mackenzie & Moncur, Limited, of Edinburgh. Mr. Lee, whose resignations were caused by ill-health, is a director of Henry Hollindrake & Son, Limited, Stockport.

Obituary

MR. F. K. ROBERTSON, who was appointed a director of J. C. Abbott & Company, Limited, gas-coal, coke, lime, and pig-iron merchants and contractors, of Birmingham, in 1945, died last month.

MR. WILLIAM WHITE, who was repair manager of R. & W. Hawthorn, Leslie & Company, Limited, Hebburn-on-Tyne, from 1928 until his retirement in 1951, died on March 18 at the age of 69.

DR. MARSTON ROGERT, Emeritus Professor of organic chemistry in Columbia University, died in New York on March 21 at the age of 85. During the first world war Dr. Bogert was a member of the executive Board of the National Research Council and was chairman of the division of chemistry and chemical technology. He also served on a large number of other official bodies in the U.S., including the Bureau of Mines and the Bureau of Standards.

MR. PETER BAXTER, a well-known personality in the steel and coal industries in the west of Scotland, died last month. Mr. Baxter, who retired three years ago, served for many years as a director of Colvilles, Limited, the Steel Company of Scotland, Limited, Colville Constructional Company, Limited, Archibald Russell, Limited, Nimmo & Dunlop, Limited, and was also chairman of Bent Colliery Company, Limited, James Dunlop & Company, Limited, and R. Y. Pickering & Company, Limited. He represented the steel trade on the Clyde Navigation Trust and the Glasgow Chamber of Commerce. In September, 1939, Mr. Baxter was seconded to the Iron and Steel Control, Ministry of Supply, and became liaison officer for Scotland and Northern Ireland. He visited Washington in 1941 at the request of Lord Beaverbrook to take charge of the British Purchasing Commission for iron and steel.

News in Brief

A LOCAL productivity committee has just been formed in Kidderminster with support from about 90 per cent. of local firms.

EXTENSIONS to enable the company to build and pack larger machines are being carried out by Noble & Lund, Limited, machine-tool makers, of Felling (Co. Durham).

WITH a 1953 output exceeding 180,000 tons, compared with 160,000 tons in 1950, Turkey now occupies fourth place among the chrome-ore producing countries of the world.

A CLAIM that the Russian Government was prepared to take 1,250 locomotives from the firm has been denied by Mr. J. B. Mavor, chairman of the North British Locomotive Company, Limited.

INDUSTRIAL BARRIER CREAMS marketed by Innoxa (England), Limited, London, N.W.1, are to be known under the name "Kerodex," to ensure that all such creams are known universally under one title.

GEO. SALTER & COMPANY, LIMITED, of West Bromwich, announce that Mr. George Rushton, sales manager of the company's roller-bearing division, has been appointed, additionally, sales manager of the retaining-ring division.

A NEW WORKSHOP, costing £50,000 and covering 12,000 sq. ft., has been opened by Thomas Adshead & Sons, Limited, aluminium and non-ferrous founders, engineers, etc., of Dudley (Worcs), to cope with increased contract work.

THAT A TRADE DELEGATION from the U.S.S.R. would visit the United Kingdom before the summer was out was forecast by Sir Greville S. Maginness, chairman of Associated British Machine Toolmakers, Limited, who is in Moscow on a trade visit.

MANUFACTURED by Davy and United Engineering Company Limited, Sheffield, two 96-ton castings, each a roll-housing for a 56-in. four stand tandem cold strip mill, left Sheffield by rail on March 20 for Liverpool, en route to Wollowong, Australia.

THE FEDERATION OF LIGHT METAL SMELTERS announces that its members' average selling prices (to the nearest 10s.) for the following alloys during the month of February were:— LM1, £143 per ton; LM2, £153 10s.; LM4, £160 10s.; LM6, £183.

A NEW MODEL of double-bogie Diesel-mechanical locomotive, intended especially for narrow-gauge industrial lines where sharp curves are a feature, has been introduced by the Hunslet Engine Company, Limited, Leeds. It is a four-axle, 14-ton, 100-h.p. design with a top speed of 11½ m.p.h.

THIS MONTH marks the 25th anniversary of the English Steel Corporation, Limited, Sheffield, which was formed in 1929 with the amalgamation of the Sheffield and Openshaw branches of Vickers-Armstrongs, Limited, and the Sheffield and Penistone works of Cammell Laird & Company, Limited.

DRAFT CONTRACTS have been signed by U.D. Engineering Company, Limited, London, N.W.10, for the supply to Russia of £1,000,000 worth of milk-bottling machinery. The order resulted from the participation of the company's representative, Mr. C. D. Wakefield, in the recent U.K. businessmen's mission to Moscow.

SIR GEORGE P. BARNETT, H.M. Chief Inspector of Factories, is to address the Institution of Works Managers at 7 p.m. on Thursday, April 8, at the Waldorf Hotel, London, W.C.2. The meeting will be an open one, thus giving an opportunity to all interested in safety in the works to hear the subject authoritatively discussed.

A FINE of £10 was imposed on Newmans Tubes, Limited, Wednesbury (Staffs), at Wednesbury Court last week for failing to maintain a reasonable temperature in one of its workshops. The temperature on February 4, when factory inspectors visited the premises, was stated to be just over 40 deg. F. in one of the shops.

A STAMPER who lost an eye, after being struck by a small splinter from a 15-cwt. hammer, was awarded £2,250 damages at Birmingham Assizes last month. Harold Reece, of Brierley Hill (Staffs), whose former earnings of £14 a week were said to have been halved, was claiming damages against his employers, Smethwick Drop Forgings, Limited.

FIRE which broke out under an oil-burning furnace at the Tyseley Metal Works Limited, Birmingham, on March 17 destroyed the shop roofing. The fire started when there was a blow-back in the furnace and molten metal fell on to an oil pipe. The oil ignited and the fire spread along the feeder pipe to the roof. No one was injured and arrangements have been made to carry on business as usual.

NEW BUILDINGS erected since the war at Glasgow University were inaugurated on March 19 by Mr. James Stuart, Secretary of State for Scotland. He said that in the last six years £2,000,000 had been spent on new building, reconstruction, and renewal. The extensions include the completion of the Chemical Institute, which means that temporary buildings can be cleared so that erection of the new engineering building can begin shortly.

SIR HAROLD HARTLEY, president-designate of the Institution of Chemical Engineers, told members of the Birmingham University Chemical Engineering Society at their annual dinner on March 16 that the two main trends in industry during the past 25 years had been the better processing of raw materials and the demand for higher qualities. He spoke of the difference between the university-trained chemical engineer and "that extinct animal" the chemical technologist.

EDGAR ALLEN AND COMPANY LIMITED, Sheffield, held the company's foremen's association dinner on March 19 at the Arcade Restaurant of Sheffield and Ecclesall Co-operative Society, Ecclesall Road, Sheffield. There were 140 present and the foremen and their wives were welcomed by Mr. T. Hall, president of the association. Directors Brigadier A. Levesley and Mr. L. K. Everitt were among those present. Also present was Mr. Jim Pass, who is now nearly 91, and was a foundry foreman with the firm until he was 77.

ENGLISH STEEL CORPORATION LIMITED, Sheffield, have booked contracts for the U.S.A. worth nearly £500,000, for special railway castings, including one-piece bogies and locomotive frames. Further large contracts are expected. English Steel Corporation were the only British firm to share in a £3 million order for railway material for India. They have just been congratulated on maintaining promised delivery dates for £30,000 worth of material. The foundry department is now fully booked for months ahead.

A COPY of the company report of the Hadfield group of companies of Sheffield, with accounts for the year and a personal message from Mr. Harold Humphries, deputy chairman and managing director, were distributed to every employee on March 20. Mr. Humphries thanked the employees for their part in improved

(*Continued on page* 372)

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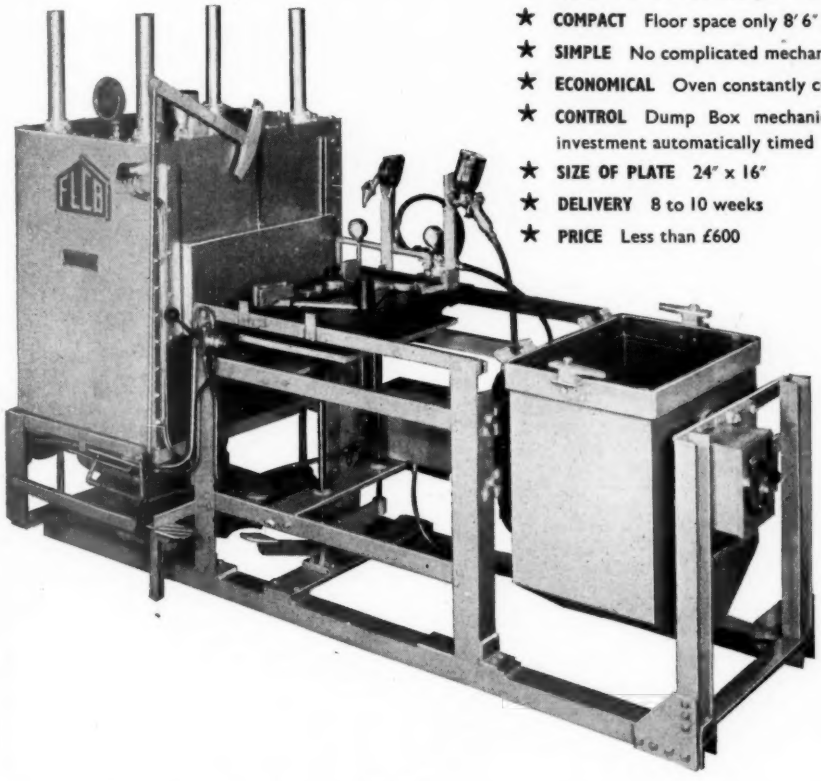

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A development of the "Shelmolda Senior" and "Junior" models, the "Shelmolda Duplus" brings high speed moulding and the advantages of automatic control by an unskilled operator, to the smallest foundry. To suit the requirements of individual foundries, the "Senior" and "Junior" models will still be available.

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News in Brief

(*Continued from page* 370)

company results but warned that market conditions demand even greater efforts for the maintenance of results. He pointed out that it was essential that the greatest care and attention be devoted to the requirements of the customers upon whom all depended for their livelihood.

THE NEW Barugh Green factory at Barnsley of Brook Motors, Limited, the Huddersfield electric motor producers, which is to be officially opened on May 28 by Sir John Keeling, chairman of the Yorkshire Woollen and Worsted Federation, has a floor space of 110,000 sq. ft. and the area of the site is 450,000 sq. ft. Already 400 employees are working there and it is proposed ultimately to employ a further 600 people in the new factory which is chiefly concerned with the winding of electric motors and the manufacture of control gear.

A MOULDER who said that following an accident at work in which he lost the tip of an index finger he was no longer able to play the piano without discomfort, was awarded £175 damages against his employers, T. H. Mold & Son, Limited, of Walsall, at Birmingham Assizes on March 25. Mr. Justice Pilcher said that the plaintiff, Arthur Davey, had shown negligence in the use of his machine equal to that of his employers in their failure to guard it. For that reason he would receive only half the damages which his injuries would otherwise justify.

MR. L. W. LAW, director and general manager of Manor Ironworks, received an award for 20 years' service at the distribution of long-service awards by Joseph Sankey & Sons, Limited, Bilston. Presentation of 82 awards was made by Mr. G. Ronald Sankey, deputy managing director, Mr. E. P. Peel, director and secretary, and Mr. C. Lovern, director and general manager of the Albert Street works. Seventy awards, representing 1,890 years' service, had earlier been made at the firm's Hadley Castle Works, Shropshire. Since the scheme began in 1935, 2,704 awards for long service have been made.

THE PRESIDENT of the Institute of Cost and Works Accountants at Cheltenham on March 20 presented to Mr. J. F. D. Cornish, works accountant of the Bristol Aeroplane Company, Limited, Filton, the Lewton Coronation Prize gained for the best paper on management accountancy by an associate of the Institute. The presentation took place at a conference organized by the South West Region of the Institute at which Mr. R. Glendinning, of the Comptroller's Department, British Transport Commission, spoke on "Statistics in relation to Cost Accountancy." He urged a higher degree of knowledge of statistics by the accountant in industry.

WELLWORTHY LIMITED of Lymington are now supplying Wellseal jointing compound in one ounce tubes, which each contain sufficient for several joints. Wellseal was the outcome of several years' intensive investigation in the Rolls-Royce research laboratories to discover a compound which would effectively seal all the joints in an engine which are subject to oil and petrol leaks. Apart from being used direct from the tube it can also be applied with a brush, and after application becomes entirely insoluble in petrol, paraffin, diesel and lubricating oils, and is unaffected by water. It is claimed that it will not flake, powder or dissolve but dries in the form of an elastic film which never becomes hard or brittle.

THE VALUE of participation by workers in safety talks in their own factories was stressed by Mr. R. Bramley Harker, Superintending Inspector of Factories, at a meeting of the Birmingham and District Industrial Safety Group on March 16. Recent figures for the division revealed that accidents in factories employing fewer than 50 workers numbered 11.4 per 1,000. Accidents in factories employing more than 50 were 16.6 per 1,000. Mr. E. I. Wilson, Deputy Superintending Inspector of Factories speaking on "Planning for Safety" suggested that the war-time fire drill instituted in factories should be revived, so that no worker should be in any doubt about the right course to take in an emergency.

THE REVO FOUNDRY COMPANY will, on and after April 1, trade in the name of New Garter Foundry, Limited, with which firm it has been associated since 1951. The company, under its new name, will continue to be wholly owned by the Revo Electric Company, Limited. The registered office and business address of the New Garter Foundry, Limited, are at Groveland Road, Tipton, Staffordshire, and the telephone numbers will be Tipton 1033 and 1743. The change, being solely a matter of internal re-organization of the company, will not in any way affect the normal trade relationships. Any accounts outstanding at March 31, 1954, for goods supplied may be paid to New Garter Foundry, Limited, and that company will assume responsibility for payments due to suppliers.

THE GENERAL ELECTRIC COMPANY, LIMITED, has received an order for a 2,500-kw. back-pressure geared turbo-alternator set for the Margam Works of the Steel Company of Wales, Limited. The turbine is to operate under steam conditions of 600 lb. pressure, 800 deg. F. total temperature, with a back pressure of 165 lb. The alternator will generate at 11 kv., 3-phase, 50 cycles. McLellan & Partners are the consultants for the Steel Company of Wales, Limited. G.E.C. have introduced a new industrial radio receiver suitable for medium-sized premises. Known as the BCS 2353/4, it has been designed to serve as the nucleus of small high-quality sound installations in small factories and similar applications. It is highly versatile, its numerous applications ranging from normal radio reception of such special programmes as those broadcast for workpeople, and to the presentation of disc recordings, and announcements, as required.

SPEAKING at the annual meeting of the Birmingham Exchange on March 18, Mr. C. J. Grazebrook, president, forecast that Britain's demand for all types of iron and steel would only be met with difficulty for some years to come. He said that the record-breaking tonnage produced during 1953 by the steel makers and the pig-iron producers were a matter for national pride. But despite the big increases in production, continuing shortage of supplies might be foreseen. The reason for this was the requirements consequent on the great expansion in the production of oil, the increasing use of steel by the railways and road transport and "in the not too distant future" the atomic energy industry. The spiral of increased costs was a source of great anxiety, Mr. Grazebrook said. He questioned whether manufacturers' practice of advancing their selling prices to cover such increases was as justified today as it had been during the sellers' market. Rather than putting up prices automatically, he said, manufacturers should first examine most carefully methods of manufacture to see whether they could not improve their "housekeeping" and so reduce costs.

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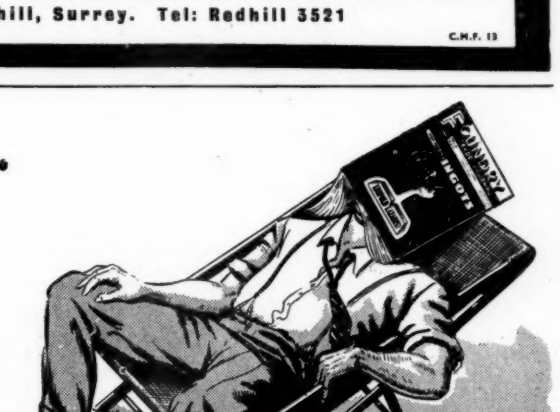

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Raw Material Markets

Iron and Steel

The continued importation of basic pig-iron from the Black Sea, and the regular arrival of cargoes of other grades of foreign iron in the Tees, point unmistakably to the fact that British blast-furnace production, now running at record levels, is still insufficient for current industrial requirements. Any shortage in the supply of basic iron can be balanced by the use of more scrap, but deficiencies in the supply of hematite and low- and medium-phosphorus irons are not easily overcome. The rising consumption of high-phosphorus iron also reflects an acceleration of activity in the light-castings trade which promises to become more pronounced as the spring advances. Recent demand for No. 3 foundry iron is sufficient to absorb the output, and reserve stocks are of quite modest proportions.

Reimposition of the import duties on semi-finished steel is a clear manifestation of the changed circumstances in this branch of the steel industry. With increased capacity British steelmakers are now able to meet all reasonable home requirements, and the probable further shrinkage of imports from near-Continental ports will impose no hardship upon re-rollers, whose requirements are limited by the almost total lack of overseas orders.

Re-rollers of small bars and light sections are working at well below capacity, but this is the only dull spot in the finishing trade. Sheetmakers are extremely busy and in some instances have been issued with extra export licences to enable them to accept additional overseas orders. The output of plates, though improving, has not yet overtaken home demands and the recent cut in the export price of plates is therefore a nominal readjustment. Heavy section mills also have substantial programmes in hand, and there is a considerable miscellaneous demand for railway and colliery equipment.

Non-ferrous Metals

Both lead and zinc were firm last week, and in the United States the price of the former metal advanced by ¼ cent to 13¼ cents per lb. Demand seems to have improved across the Atlantic and the situation is more in equilibrium than it has been for some time past, but whether in due course we shall find that the chief Custom smelter is obliged to reduce the quotation in order to attract purchases remains to be seen. On balance last week March gained £2 15s. on the Metal Exchange and June £2 5s., the backwardation widening to £1 15s., although it would not appear that there is any particular scarcity of early metal. Zinc also gained ground, to the tune of £2 5s. for March and £2 for June, the backwardation widening slightly to 25s. Here again, it can be said that the scarcity is no longer as acute as it was and it is believed that most consumers now enjoy a fairly comfortable stock-holding. Copper was firm up to Thursday, when, on a near record turnover of 2,400 tons, the settlement price jumped up £5 to £239. The following day, however, there was something of a collapse and the week closed at £234 cash and £227 three months, the "back" of £7 being the lowest recorded since the market reopened. On balance cash lost £2, while three months gained 10s.

The end of the week brought news that Chile at last sold 100,000 short tons of copper to the U.S. stockpile, one report giving the price as 29¼ cents. It now remains to be seen what will happen to the other 100,000 tons which Chile is reported to be holding. Tin lost ground last week, the cash position closing £30 down at £720 on Friday afternoon. Three months lost only £5 and the backwardation narrowed to £20. Fears are now being expressed that the tin scheme may not go through owing to the fact that France, Germany, and perhaps Canada may withhold their consent. However, most people believe that in the long run something will be done to keep the world's tin production within reasonable bounds.

Official metal prices were as follow:—

COPPER, Standard—*Cash:* March 25, £238 to £239; March 26, £233 to £234; March 29, £235 10s. to £236 10s.; March 30, £235 to £236; March 31, £234 10s. to £235 10s.

Three Months: March 25, £229 to £229 10s.; March 26, £226 to £226 10s.; March 29, £226 10s. to £227; March 30, £227 10s. to £228 10s.; March 31, £228 to £228 10s.

TIN, Standard—*Cash:* March 25, £725 to £730; March 26, £722 10s. to £725; March 29, £727 10s. to £732 10s.; March 30, £725 to £730; March 31, £736 to £738.

Three Months: March 25, £690 to £692 10s.; March 26, £702 10s. to £705; March 29, £702 10s. to £704; March 30, £702 10s. to £705; March 31, £706 10s. to £707 10s.

ZINC—*March:* March 25, £75 15s. to £75 17s. 6d.; March 26, £76 5s. to £76 7s. 6d.; March 29, £79 10s. to £80; March 30, £78 15s. to £79. *April:* March 31, £79 to £79 5s.

June: March 25, £74 5s. to £74 15s.; March 26, £74 15s. to £74 17s. 6d.; March 29, £78 5s. to £78 10s.; March 30, £77 5s. to £77 10s. *July:* March 31, £77 10s. to £77 15s.

LEAD—*March:* March 25, £87 10s. to £88; March 26, £89 to £89 5s.; March 29, £91 5s. to £91 15s.; March 30, £91 10s. to £91 15s. *April:* March 31, £91 10s. to £91 15s.

Second half June: March 25, £86 10s. to £86 15s.; March 26, £87 15s. to £88; March 29, £89 5s. to £89 10s.; March 30, £89 10s. to £89 15s. *First half July:* March 31, £89 17s. 6d. to £90.

Higher Prices for Tungsten Ores

The Ministry of Materials announces that its selling prices for tungsten ores of standard 65 per cent. grade and ordinary quality have been increased as follows:—Wolframite, from 130s. to 145s.; scheelite, from 125s. to 140s., per ton, delivered consumers' works.

The new prices came into effect on Tuesday.

Contracts Open

Details of tenders with the reference ESB can be obtained from the Board of Trade, Export Services Branch, Room 801, Lacon House, Theobalds Road, London, W.C.1 (telephone: CHAncery 4411, ext. 738 or 771), unless otherwise stated.

AUSTRALIA, April 28—Air compressors, for the State Electricity Commission of Queensland. (ESB/6660/54.)

FORMOSA, April 5—Steel pipes, gate valves, and wire rope, for the Central Trust of China, US Aid Division. (ESB/6063/54.)

PAKISTAN, April 1—Cast-iron pipes and fittings, for the Director General of Supply and Development, Ministry of Industries, Government of Pakistan. (ESB/6155/54.)

SYRIA, May 24—Cast-iron water pipes, for the Figeh Water Commission, Damascus. (ESB/5881/54.)

FORMOSA, April 7—Steel conduits, couplings, elbows, unilet bodies, and guy wire hangers, for the Central Trust of China, US Aid Division. (ESB/6070/54.)

FORMOSA, April 7—Fan, exhaust, furnace, and crucibles, for the Central Trust of China, US Aid Division. (ESB/6081/54.)

FORMOSA, April 7—Free wheeling riddle, sand-conditioning equipment, floor rammer, and pneumatic rammer, for the Central Trust of China, US Aid Division. (ESB/6082/54.)